



**United States Department of Agriculture
Forest Service**

Rio Grande National Forest

Land Management Plan

**Alamosa, Archuleta, Conejos, Hinsdale, Mineral,
Rio Grande, Saguache, and San Juan Counties, Colorado**

August 2019



Rio Grande Pyramid in the Weminuche Wilderness

Acronyms and Abbreviations

AIR – Air quality
CCF – One hundred cubic feet
CDT – Congressionally designated trail
CFR – Code of Federal Regulations
CR – Cultural resources
CWD – Coarse woody debris
DBH – diameter at breast height
DC – Desired condition
FISH – Fisheries
FIRE – Fire management
FSH – Forest Service Handbook
G – Guideline
GDE – Groundwater-dependent ecosystem
HUC – Hydrologic Unit Code
INFR – Infrastructure
INDS – Insects and disease
LAND – Lands
LYNX – Canada lynx
MA – Management area
MIN – Minerals
NNIS – Aquatic and terrestrial nonnative invasive species and noxious weeds
OBJ – Objective
PAOT – Persons at one time
REC – Recreation management
RNG – Range management
ROS – Recreation opportunity spectrum
RMZ – Riparian management zones
S – Standard
SCC – Species of conservation concern
SOIL – Soils
SUIT - Suitability
TEPC – Threatened, endangered, proposed, and candidate species
USDA – U.S. Department of Agriculture
VEG – Vegetation management
WA – Watershed
WLDF – Wildlife and plants

Rio Grande National Forest Land Management Plan

**Alamosa, Archuleta, Conejos, Hinsdale, Mineral,
Rio Grande, Saguache, and San Juan Counties, Colorado**

Lead agency:	USDA Forest Service
Responsible official:	Dan Dallas, Forest Supervisor 1803 W. Highway 160 Monte Vista, CO 81144
For more information, contact:	Judi Pérez, Forest Planner 1803 W. Highway 160 Monte Vista, CO 81144 719-852-5941
Planning documents are posted at:	<u>Forest Plan Revision Webpage</u>

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Forest Plan

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- Fisheries Activity Period Map – West

Photo credits: Mike Blakeman

Chapter 1. Introduction

This land management plan provides direction for the management of the Rio Grande National Forest by guiding programs, practices, and projects. Land management plans are referred to as forest plans. For ease of discussion throughout the forest plan the term “Forest” is used to reference the Rio Grande National Forest as an administrative unit. The term “forest” refers to the resources.

What is a Forest Plan?

Forest plans establish overall management direction and guidance for each national forest. The Rio Grande’s forest plan guides project implementation, practices, and uses that assure sustainable multiple use management and outputs for the Rio Grande National Forest. The forest plan describes desired conditions, goals, objectives, standards, and guidelines, and identifies land suitability for multiple uses and resources in the plan area. This is similar to a city or county comprehensive plan that helps guide land use and development. Forest plan direction applies only to National Forest System lands and does not imply or form direction for other ownerships (36 CFR 219.2).

Forest plans are strategic in nature and do not compel any action, authorize projects or activities, or guarantee specific results. Forest plans provide the vision and strategic direction needed to move a national forest toward ecological, social, and economic sustainability. Project-level environmental analysis will be completed for specific proposals that implement forest plan direction. A forest plan may restrict the agency authorizing or implementing projects and activities. Projects and activities must be consistent with the forest plan (36 CFR 219.15).

Plan components included in forest plans provide integrated management direction that provide for the social, economic, and ecological sustainability and multiple uses of national forest lands and resources. In May 2012, the U.S. Department of Agriculture adopted 36 CFR 219 regulations, commonly called the 2012 Planning Rule, to guide collaborative and science-based development, amendment, or revision of forest plans that promote the ecological integrity of national forests while considering social and economic sustainability.

The forest plan provides guidance for project- and activity-level decision-making on the Forest for approximately the next 15 years. This guidance includes:

1. Forestwide components that provide for integrated social, economic, and ecological sustainability and ecosystem integrity and diversity as well as ecosystem services and multiple uses; components must be within Forest Service authority and consistent with the inherent capability of the plan area (36 Code of Federal Regulations (CFR) § 219.7 and CFR § 219.8–219.10);
2. Recommendations to Congress for lands suitable for inclusion in the National Wilderness Preservation System, and rivers eligible for inclusion in the National Wild and Scenic Rivers System (36 CFR § 219.7(2)(v) and (vi));
3. The area’s distinctive roles and contributions within the broader landscape;
4. Identification or recommendation of other designated areas (36 CFR § 219.7 (c)(2)(vii));

5. Identification of suitability of areas for the appropriate integration of resource management and uses, including lands suited and not suited for timber production (36 CFR § 219.7(c)(2)(vii) and § 219.11),
6. Identification of the maximum quantity of timber that may be removed from the plan area (36 CFR § 219.7 and § 219.11 (d)(6)),
7. Identification of geographic area or management area specific components (36 CFR § 219.7 (c)(3)(d),
8. Identification of watersheds that are a priority for maintenance or restoration (36 CFR § 219.7 (c)(3)(e)(3)(f), and
9. A monitoring program (36 CFR § 219.7 (c)(2)(x) and § 219.12).

Forest plans do not regulate public uses. A project or activity decision that regulates public use may be made concurrent with plan approval, plan amendment, or plan revision (36 CFR Part 261, Subpart B). The forest supervisor or district ranger is the responsible official for project and activity decision, unless otherwise delegated.

A forest plan establishes desired conditions, objectives, standards, guidelines, and land suitability. These are required plan components under the 2012 Planning Rule and Forest Service Handbook 1909.12. The components guide future projects and decision-making and should be in compliance with, but not repeat, agency direction.

The 2012 Planning Rule implemented a three-phase process that includes assessment, plan development, and monitoring (Figure 1). Assessments for the plan revision process were completed in 2016. The final decision and final document represent the culmination of the plan development phase and the initialization of the monitoring phase.

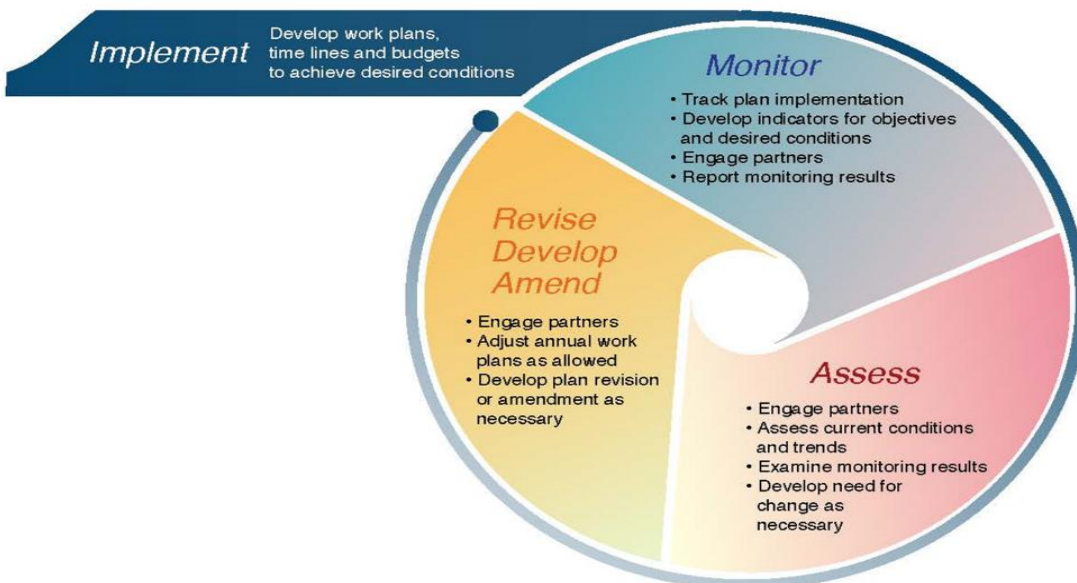


Figure 1. The three-phase process described in the 2012 Planning Rule

Implementing the Forest Plan

The forest plan guides resource management. The forest plan does not authorize projects, activities, or site-specific prohibitions or commit the Forest Service to take action. The Forest will follow all laws, regulations, and policies that relate to managing National Forest System lands. The forest plan is designed to supplement, not replace, direction from these sources. Other Forest Service direction, including laws, regulations, policies, executive orders, and directives (manual and handbook), are not repeated in the forest plan. Appendix H lists much of the higher level direction.

During project-level, site-specific analysis, agency planning teams should:

1. Identify applicable Forestwide plan components (desired conditions, objectives, standards, and guidelines) for the proposed project (see Chapter 2), and
2. Identify management area specific plan components that potentially would be affected by the proposed project (see Chapter 3).

Project and Activity Consistency with the Forest Plan

The National Forest Management Act of 1976 and the 2012 Planning Rule require that all projects and activities authorized by the Forest Service must be consistent with all applicable plan components (16 U.S.C. 1604 (i) as described at 36 CFR § 219.15 (c and d)). The approving document must describe how the given project or activity is consistent with applicable plan components by meeting the following criteria (36 CFR § 219.15(d)):

1. **Desired conditions and objectives.** Projects or activities contribute to the maintenance or attainment of one or more desired conditions or objectives or do not foreclose the opportunity to maintain or achieve any desired conditions or objectives over the long term.
2. **Standards.** Projects or activities comply with applicable standards.
3. **Guidelines.** Projects or activities
 - a. Comply with applicable guidelines as set out in the plan, or
 - b. Are designed in a way that is as effective in achieving the purpose of the applicable guidelines (§ 219.7(e)(1)(iv)).
4. **Suitability.** Projects or activities occur in an area
 - a. That the plan identifies as suitable for that type of project or activity, or
 - b. For which the plan is silent with respect to its suitability for that type of project or activity.

When a proposed project or activity would not be consistent with the applicable plan components, the responsible official can do one of the following, subject to valid existing rights (36 CFR § 219.15(c)):

- Modify the proposed project or activity to make it consistent with the applicable plan components,
- Reject the proposal or terminate the project or activity,

- Amend the plan so that the project or activity will be consistent with the plan as amended, or
- Amend the plan contemporaneously with the approval of the project or activity so that the project or activity will be consistent with the plan as amended. This amendment may be limited to apply only to the project or activity.

Forest Plan

Revising a forest plan creates a new plan for the entire plan area. Forest plans revised under the 2012 planning rule should include:

- Plan components, including Forestwide and management area specific desired conditions, objectives, standards, and guidelines;
- Suitability determinations of lands for specific multiple uses, including those lands suitable for timber production;
- Estimates of the long-term sustained yield and projected timber sale quantity;
- Descriptions of the plan area's distinctive roles and contributions within the broader landscape;
- Identification of priority restoration watersheds (Appendix G);
- Proposed management actions and strategies that may occur on the plan area over the life of the plan (Appendix I);
- Areas proposed to be recommended to Congress for inclusion in the National Wilderness Preservation System;
- Rivers identified as eligible for inclusion in the National Wild and Scenic Rivers System; and
- Forest plan monitoring program, including focal species.

Plan Components

Plan components guide future projects and activities. Plan components are not commitments or final decisions approving projects or activities.

Desired Conditions

The 2012 Planning Rule states, “a desired condition is a description of the specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. Desired conditions must be described in terms that are specific enough to allow progress toward their achievement to be determined, but do not include completion dates.” (36 CFR 291.7(e)(1)(i))

Some resources may already be at their desired condition, while desired conditions for other resources may only be achievable over a longer period than the 10- to 15-year planning horizon.

Objectives

According to the 2012 Planning Rule, “an objective is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions.” (36 CFR 219.9 (e)(1)(i))

Objectives were developed considering the historic and anticipated budget allocations for the Forest, as well as professional experience in implementing various resource programs and activities. Objectives can exceed or not meet an accomplishment based on numerous factors, including budget and staffing increases or decreases, changes in planning efficiencies, and unanticipated resource constraints.

Standards

The 2012 Planning Rule defines standards as “a mandatory constraint on project and activity decision-making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements” (36 CFR 219.7(3)(1)(iii)). Standards can be applied Forestwide, or specific to a particular management area.

Guidelines

Guidelines are described in the 2012 Planning Rule as “a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guidelines is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements” (36 CFR 219.7(3)(1)(iv)). A guideline can be Forestwide or specific to a management area.



Figure 2. Regenerating aspen in an area burned in the 2013 Papoose Fire

Suitability of Lands

Suitability determinations are required by the 2012 Planning Rule. The rule states, “Specific lands within a plan area will be identified as suitable for various multiple uses or activities based on the desired conditions applicable to those lands. The plan will also identify lands within the plan area as not suitable for uses that are not compatible with desired conditions for those lands. The suitability of lands need not be identified for every use and activity. Suitability identifications may be made after consideration of historic uses and of issues that have arisen in the planning process. Every plan must identify those lands that are not suitable for timber production.” (36 CFR 219.7(e)(1)(v))

The identification of suitability of lands for a particular use in the forest plan indicates that the use may be appropriate but does not authorize a specific commitment. Uses or activities may not occur in areas that are identified as not suitable for that use or activity. Subsequent site-specific analysis compliant with the National Environmental Policy Act must be done to prohibit an existing use or authorize a new use. Generally, Forest lands are suitable for uses and management activities appropriate for national forests, such as outdoor recreation or timber, unless identified as not suitable.

Goals

Goals can be included as optional plan components. Goals are broad statements of intent, other than desired conditions, typically related to process or interaction with the public. Goals are expressed in broad general terms, but do not include completion dates. (36 CFR 219.7(e)(2))

Other Required Plan Content

The 2012 Planning Rule also requires that plans include “other required content” (36 CFR § 219.7(f)(1)) addressing the distinctive roles and contributions of the plan area (see below), a monitoring program (Chapter 4), priority watersheds (Appendix G), and proposed and possible actions (Appendix I).

Optional Plan Content

A plan may include additional content, such as potential management approaches or strategies and partnership opportunities or coordination activities 36 CFR § 219.7(f)(2). Optional plan content can be changed through administrative changes.

Management Approaches

Management approaches are optional plan content (FSH 1909.12 § 22.4) that describes the principal strategies and program priorities the responsible official intends to use to carry out projects and activities developed under the plan. Management approaches can convey a sense of priority and focus among objectives and the likely management emphasis. They relate to desired conditions and may indicate the future course or direction of change while recognizing budget trends, program demands, and accomplishments.

Strategic Planning Framework

The forest plan was developed based on a strategic framework that includes: vision, strategy, tactical, monitoring, and adaptive management levels. Each level provides information to help resource managers determine how to maintain or appropriately adapt forest plan direction while continuing to maintain or move toward desired conditions.

Forestwide goals present broad statements of intent, or vision, other than desired condition. These often look more like vision statements that all other direction tiers to. To incorporate the many uses on the Forest and manage the resources in a sustainable manner, three goals have been established to convey the intent of plan direction. The goals address watersheds and watershed health, sustainable ecosystems, social and economic contributions of the Forest to the surrounding communities, and connecting citizens to the land. The goal statements are numbered to allow for reference, not to indicate priority.

Goal 1

Maintain and restore sustainable, resilient terrestrial ecosystems

Ecosystems are a barometer of the quality of land management practices. A natural variety of species, genetic composition, and ecological processes are key to providing the diversity needed for resiliency in the face of environmental disturbances and changes.

Where appropriate in the next planning horizon, diversifying age classes and structure, seral stages, and habitat classes while providing for and maintaining habitat connectivity would provide multiple ecosystem benefits. Increased resilience to insect and disease outbreaks, responsiveness to warmer, drier weather patterns, and increased ecosystem services are just a few of the many benefits provided by sustainable, resilient ecosystems. Ecosystems are managed for connectivity across jurisdictional boundaries. Forest management to maintain and restore sustainable, resilient terrestrial ecosystems will also provide for connectivity of habitat across the landscape. Connectivity of habitats is an important component of ecological integrity and is conducive to making ecosystems more sustainable and resilient to natural disturbances and stressors. The Forest will continue to collaborate and cooperate with other agencies, units, partners, groups, state and local agencies, and individuals.

Forest ecosystems vary by elevation and range from alpine tundra at the highest elevations to pinyon-juniper woodland and sagebrush ecosystems at the lowest elevations. Between the extremes are spruce-fir ecosystems, mixed conifer, and a small amount of Rocky Mountain Gambel oak.

These ecosystems provide habitat for many species of mammals, birds, and reptiles. Amphibians and fish are found in the various wetland ecosystems that occur across the Forest.

Commercial and noncommercial forest and wood products are provided to meet the needs of the public in a sustainable manner to provide for the needs of future generations.

Goal 2

Protect and restore watershed health, water resources, aquatic ecosystems, and the systems that rely on them

National forests that exist today were initially created under the guidance of the National Forest Reserve Act of 1891, which allowed the President of the United States to set aside forest reserves from land in the public domain. This Act provided for wise use of the lands that provide protection of timber at the headwaters of streams, reduce downstream flooding, and provide a summer-long water supply for irrigation in the arid West (Muhn 1992). Protecting and restoring watershed health reaffirms the Act that created today's national forests.

Water from National Forest System lands, including the Rio Grande National Forest, supports outdoor recreation, biological diversity, wildlife species and habitats, agricultural irrigation, and flood control. National forests provide clean, abundant water for municipal water supplies, and for local and regional aquifer systems.

Opportunities for collaborative stewardship of watersheds emphasize the interrelated biological, economic, and social factors that affect these areas. Healthy and functioning watersheds contribute to overall resource health.



Figure 3. Rio Grande headwaters near Stony Pass

Goal 3

Actively contribute to social and economic sustainability in the broader landscape and connect citizens to the land

National Forest System lands contribute forest products and tourism opportunities that are important to national and local economies. They provide ecosystem services for current and future generations. These lands have been influenced by humans while protecting areas of tribal

importance and traditional uses and other areas of religious or cultural importance. Opportunities are available for individuals, partners, and organizations to be active participants in managing, monitoring, and implementing projects that achieve integrated resource management goals.

National Forest System lands provide landscapes with scenic diversity that appear natural, recreational opportunities, and outdoor experiences that range from primitive to developed, with campgrounds, and restrooms. Interpretive opportunities increase public knowledge, provide historical background, and promote connection of the current people to the past and their land. Designated areas, such as wilderness and wild, scenic, and recreational rivers, are maintained to protect resource integrity and avoid impacts associated with public use levels.

Cultural resources, including areas acknowledged as traditional cultural properties and other significant areas identified in consultation with tribes and local communities, provide tangible links to historically rooted beliefs, customs, and practices. Cultural resources are managed in compliance with applicable laws, regulation, and policy. Heritage resource sites are managed and interpreted in compliance with all applicable laws and regulations. Historic resources are preserved and protected, and when eligible, nominated to the National Register of Historic Places.

The 2012 Planning Rule (36 CFR 219) defined ecosystem services to include provisioning services such as air, energy, fiber, minerals, and water; regulating services such as soil stabilization; and cultural services that include cultural heritage values and recreational experiences. The Forest strives to meet the demand for these services.

National Forest System lands are used by private industry and other government organizations under special use authorization to provide services for the public that live or recreate around or on these lands. These uses include power generation and transmission, roads for access to the Forest and private inholdings, communication, water storage and transmission, as well as other uses.

Distinctive Roles, and Contributions

The Rio Grande National Forest is administered by the U.S. Forest Service and is one of 154 national forests nationwide. The Forest is within the Rocky Mountain Region, which oversees national forests and grasslands in Colorado, Kansas, Nebraska, South Dakota, and Wyoming. There are 11 national forests and 4 national grasslands in the Rocky Mountain Region.

The Forest consists of approximately 1.83 million acres in south-central Colorado (Figure 4) and forms the backdrop for the San Luis Valley, one of the largest mountain basins in the world. The Forest is named for the Rio Grande as the river's headwaters originate within the Forest boundary. National Forest System lands provide water for municipal, industrial, and agricultural purposes, and the Forest was established in large part for the protection of these watersheds.

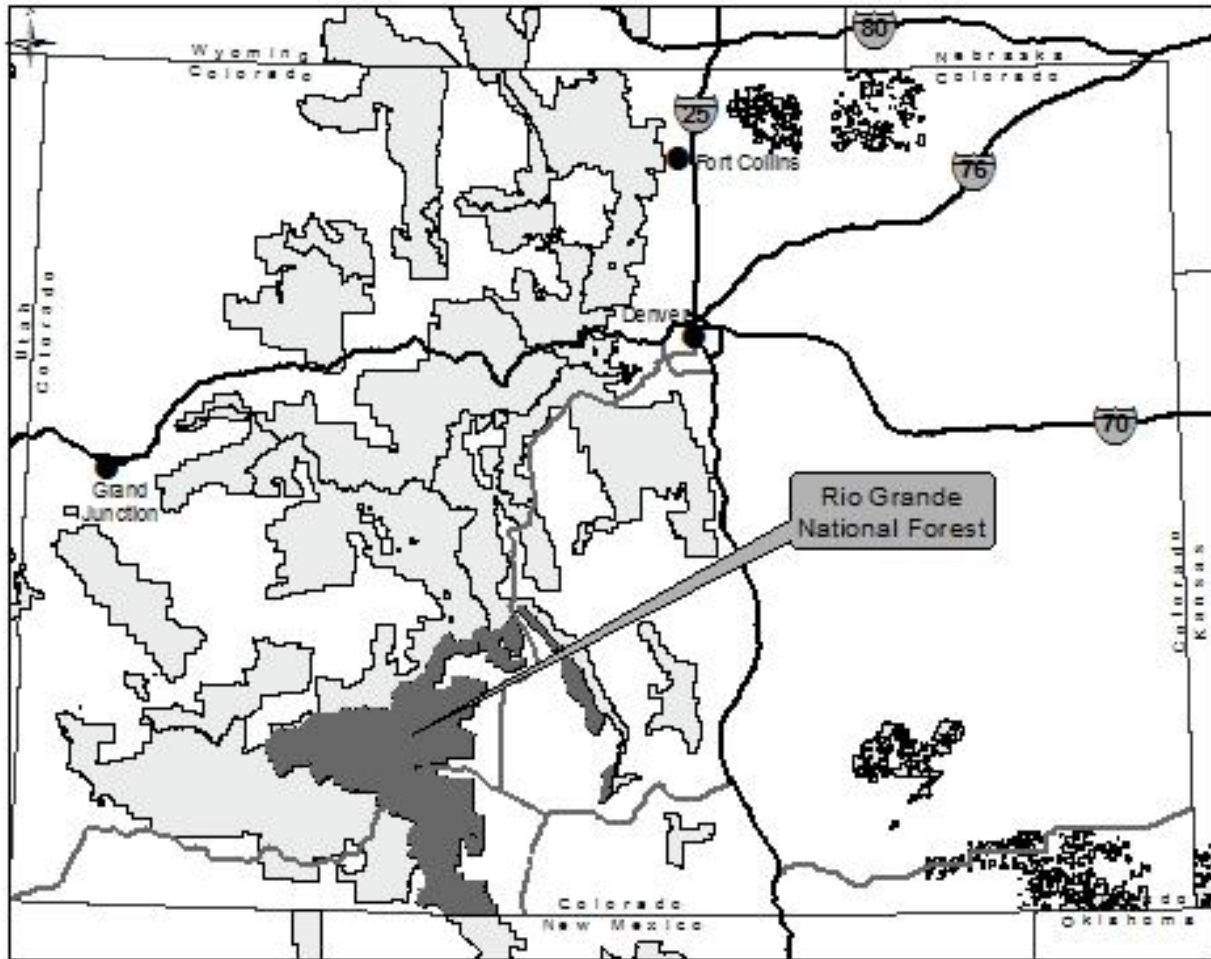


Figure 4. Location of the Rio Grande National Forest in Colorado

The Forest Service, administered by the U.S. Department of Agriculture, is one of several public land management agencies in the area. Local Department of Interior agencies include the Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service. All of the agencies work collaboratively across boundaries.

State agencies also manage lands and resources in close proximity. Forest staff regularly collaborate with Colorado Parks and Wildlife in managing wildlife species and their habitat, including elk and bighorn sheep. State agencies are responsible for creating and enforcing hunting regulations. Colorado Parks and Wildlife directs herd location and management related to the habitat management responsibilities of the Forest. Big game hunting is an important part of Colorado's economy, which the national forests support.



Figure 5. Bighorn sheep ewe

The San Juan Mountains form the western boundary of the Forest. Elevation ranges from about 7,800 feet in the foothills to more than 13,000 feet along the Continental Divide. The eastern boundary follows the Sangre de Cristo mountain range, where elevations exceed 14,000 feet.

The San Luis Valley lies between the two ranges. The valley contains very little National Forest System land. Most National Forest System lands are located in the Sangre de Cristo and San Juan mountain ranges on either side of the San Luis Valley.

The range of ecosystems that occurs on the Forest is generally determined by elevation. At the highest elevations is alpine tundra, which transitions into spruce-fir forests, which is generally inhabited by Engelmann spruce and subalpine fir mixed with aspen. Vegetation in these ecosystems has been substantially altered by the recent spruce bark beetle infestation.

Below the spruce-fir ecosystem are the mixed-conifer ecosystems, which occur in the transition zone between the higher elevation spruce-fir and the lower elevation pinyon-juniper. These ecosystems range from wet to drier ecosystem sites. They include a mix of conifer species, such as ponderosa pine, Douglas fir, white fir, Colorado blue spruce, and smaller amounts of aspen. Depending on site conditions, limber pine, bristlecone pine, and some pinyon pine or juniper can also be present.

At lower elevations is the pinyon-juniper woodland ecosystem, which includes pinyon pine, Rocky Mountain juniper, and Utah juniper. These woodlands generally occur on warm, dry sites

on mountain slopes, mesas, plateaus, and ridges. Understory species include sparse perennial grasses, annual and perennial forbs, and sparse shrubs.

Small amounts of Rocky Mountain Gambel oak shrubland ecosystems are present at the north end of the San Luis Valley near Poncha Pass. The Southern Rocky Mountain montane-subalpine grassland ecosystem includes Arizona fescue, Thurber fescue, and several other grasses, forbs, and sedges.

The Forest occupies the headwaters of the Rio Grande, which flows nearly 2,000 miles from the Continental Divide in southwestern Colorado to the Gulf of Mexico. All public water supplies in the San Luis Valley use water that either wholly or partially originates on Forest lands.

The Rocky Mountain riparian ecosystem includes numerous riparian types in the upper montane and subalpine zones. These systems are highly varied and generally consist of cottonwoods, willows, sedges, and other herbaceous vegetation, aspen, and conifers such as blue spruce, Engelmann spruce, and subalpine fir.

The Forest provides habitat for many species of mammals, birds, reptiles, amphibians, and fish. Eight species are federally recognized as threatened or endangered animal species including: black-footed ferret, Canada lynx, Gunnison sage grouse, Mexican spotted owl, New Mexico meadow jumping mouse, southwestern willow flycatcher, Uncompahgre fritillary butterfly, and yellow-billed cuckoo.

The Forest represents a large part of the core area for Canada lynx, which were reintroduced to Colorado from 1999 to 2006. The vast majority of Canada lynx in Colorado remain and reproduce in the high-elevation spruce-fir zone in the southwestern part of the state.

The various ecosystems provide clean air and water, recreation opportunities, and wood products, for Forest visitors.

Counties containing National Forest System lands include Alamosa, Archuleta, Conejos, Hinsdale, Mineral, Rio Grande, Saguache, and San Juan. Many counties are characterized by low population densities, high unemployment, and low per capita income.

Colorado communities within these eight counties as well as Chafee, Costilla, Fremont, Gunnison, Huerfano, La Plata, Montrose, and Park Counties, and New Mexico communities in Rio Arriba and Taos Counties, have strong socioeconomic ties to the Forest. Residents from local and surrounding communities rely on the Forest for gathering forest products such as firewood, and for recreational activities including hiking, camping, hunting, and more.

Outdoor adventure in southwestern Colorado has a reputation for diversity and excellence. The Forest has diverse recreational opportunities from nonmotorized activities such as backpacking, hiking, fishing, snowshoeing, and skiing to motorized activities such as dirt biking, four-wheeling, and snowmobiling. Forest lands include a variety of developed recreation sites, many areas for dispersed recreation, recreation rentals, seven of the state's 14,000-foot mountain peaks (fourteeners), and several other unit recreation areas.

Because of the proximity to open spaces, natural settings, and easy access to year-round opportunities, communities surrounding the Forest have become increasingly attractive to new residents. Population projections indicate that this area of Colorado will continue to grow, increasing demands on Forest resources.

The jagged peaks of the Sangre de Cristo and San Juan Mountains surround the San Luis Valley. Whether viewing mountain scenery from roads or finding challenge on trails or rushing rivers, visitors discover solitude and self-reliance through uncrowded year-round recreation opportunities. The Forest's recreation niche addresses solitude in every season. As recreation pressures increase in other parts of Colorado, the public lands surrounding the San Luis Valley maintain their remote spirit and traditional culture.

More than 1,350 miles of trails traverse the Forest including the Colorado Trail, West Lost Trail, and the congressionally designated Continental Divide National Scenic Trail and Old Spanish National Historic Trail. An estimated 170 miles of the Continental Divide National Scenic Trail traverse the Forest, starting at the Forest boundary with the Gunnison National Forest and stretching to the New Mexico state line. Sections of the Old Spanish National Historic Trail, designated in 2002, follow trade routes used to transport supplies and slaves from Santa Fe to the California territory in the 1820s. The West Lost Trail on the Divide Ranger District is a designated national recreation trail.

Colorado has the sixth-highest amount of National Forest System lands nationwide, with about 14,471,800 acres of national forest and grasslands that provide places for recreation activities for residents and visitors. The Forest makes up 13 percent of National Forest System lands in the State of Colorado. For Colorado and most of the Rocky Mountains, tourism is a main source of income. The beautiful scenery provided by the Forest directly ties to local economic benefits.

The Silver Thread and Los Caminos Antiguos Scenic Byways traverse the Forest along with a well-developed system of roads and trails. Many outfitter and guide services provide visitor opportunities to experience the Forest.

The Rio Grande National Forest offers unique scenic experiences. Southwestern flora combine with the spectacular scenery of the central Rocky Mountains. To the east, the open floor of the San Luis Valley is surrounded by the rugged mountain peaks of the Sangre de Cristo range. To the north, high mountain peaks give way to gentler rolling hills covered in lodgepole pine that extend to the valley bottom. Looking west, the scattered mountain peaks are mixed with rolling hills, canyons, and open meadows. To the south, the valley is fairly flat, with several dominant, rounded mountains rising above the horizon.

These characteristics offer visitors some of Colorado's most beautiful scenery. The Sangre de Cristo range is home to several of Colorado's 14,000-foot peaks, including Crestone Peak, Crestone Needles, Kit Carson, and Blanca Peak. The National Park Service manages Great Sand Dunes National Park and Preserve, which borders the Forest in the Sangre de Cristo range. The park is home to the tallest sand dunes in North America.

Rio Grande Pyramid, North Clear Creek Falls, Bristol Head Mountain, the headwaters of the Rio Grande (river), and the La Garita, South San Juan, and Weminuche Wilderness areas are all in the western part of the Forest. Parks and open meadows contain a variety of plant and animal life and are home to a wide range of wildflowers.

Historic scenic areas include the Bachelor Loop, near Creede, Colorado; the Bonanza Loop, near Villa Grove, Colorado; and the Cumbres and Toltec Scenic Railroad, near Antonito, Colorado. These areas provide a glimpse into the past and allow visitors to connect with local history.

Relationship to Other Guidance

Management of National Forest System lands is directed from several levels. National and regional direction includes laws, executive orders, regulations, and Forest Service policies. Forest plans provide direction for managing resources at a project or site-specific level. The Forest contributes to national strategic guidance in the context of its unique combination of social, economic, and ecological conditions. This plan helps define the role of the Forest in advancing the agency's national strategy and reflects the national goals. The plan is reflective of the mission of the Forest Service, which is "to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations." The plan also considers direction from other applicable tribal, federal, state, and county plans and strives to incorporate these organizational goals through an "all lands" integrated approach that considers the broader landscape in which the plan operates.

The goals and objectives outlined in the Forest Service's [2015–2020 Strategic Plan](#) were taken into account during revision of the forest plan. The additional laws, policies, regulations, and agency direction tiered to by this plan are listed in Appendix H.

Consultation with adjacent federal, state, and county land managers occurred during development of the plan, and collaborative efforts will continue as the plan is implemented.

Rights and Interests

The forest plan provides a strategic framework that guides future management decisions and actions. As such, forest plans do not create, authorize, or execute any ground-disturbing activity. The forest plan will not subject anyone to civil or criminal liability and will not create legal rights. Forest plans do not change existing permits or authorized uses. To change existing uses, for example, a subsequent decision would be needed.

Chapter 2. Forestwide Direction

This chapter contains management direction that applies Forestwide unless more restrictive direction is specified in Chapter 3. Forestwide direction include desired conditions, objectives, standards, guidelines, and land suitability determinations. Laws, regulations, policies, executive orders, and Forest Service directives (in Forest Service manuals and handbooks) are generally not contained in forest plan components.

This chapter is organized with associated resource direction listed in alphabetical order under the most applicable goal. Most resource areas could be placed under multiple goals. Because the need for plan components and direction varies by resource, not every resource includes every plan component. Some resource sections may have only guidelines, while others have the full complement of desired conditions, objectives, standards, and guidelines.

Goal 1

Maintain and restore sustainable, resilient terrestrial ecosystems

Aquatic and Terrestrial Nonnative Invasive Species and Noxious Weeds (NNIS)

Nonnative invasive species and noxious weeds include plant and animal species that disrupt ecosystem integrity and displace habitat for native plants and animals. Integrated pest management approaches are applied when treating invasive plant species. These include effective prevention and education programs that combine mechanical, biological, cultural, and chemical methods of control.

Nonnative invasive species and noxious weeds for both aquatic and terrestrial ecosystems are treated under the same program at the Forest level. The direction is combined and contained here; however, it is also applicable to water resources identified in Goal 2.

Management Approaches

Principal strategies and program priorities to reduce or control existing and new aquatic and terrestrial invasive species

The risk of introducing and spreading nonnative plant and animal species and noxious weeds is minimized for all activities, as appropriate. The spread of nonnative invasive species and noxious weeds is mitigated in places where these species are already present. Special designated areas, including roadless and wilderness areas, will generally be prioritized for treatment.

Information from partners, including the Colorado Department of Agriculture, is incorporated into the Invasive Species Action Plan, which identifies priority species, inventory and monitoring, and tools and techniques to address nonnative invasive species.

Continued coordination and cooperation with Colorado Parks and Wildlife helps reduce the potential to introduce, and to control the spread of, aquatic invasive species. Effective prevention and control methods for aquatic nuisance species are shared with fishermen, rafters, and other water recreational users.

Project implementation minimizes the extent of areas affected by existing populations and reduces the chance of introducing new species. Timely and effective revegetation of disturbed sites provides protection of soil and water resources that cannot be restored naturally.

All biological, cultural, and chemical tools are available to reduce or control nonnative invasive species and noxious weeds. Technological advances are incorporated into management practices when shown to be equivalent to, or more effective than, existing treatments.

Desired Conditions

DC-NNIS-1: Populations of aquatic and terrestrial nonnative invasive species do not occur or are low in abundance. Those that do occur do not disrupt ecosystem function. (Forestwide)

DC-NNIS-2: Native ecosystems are resilient to invasion by nonnative invasive species. (Forestwide)

Objectives

OBJ-NNIS-1: Reduce terrestrial or aquatic nonnative invasive species on 5,000 acres over the next 15 years. (Forestwide)

Fire Management (FIRE)

This section provides guidance on the management of both wildfires and prescribed fires, as well as fuels treatment activities to meet various desired conditions and resource objectives. This guidance carries forward into the Forest spatial fire management plan that provides the strategic objectives and management requirements for managing wildfires. The spatial fire plan resides in the Wildland Fire Decision Support System, but as technology advances this may change over time.

Wildland fire management is balanced between wildfire suppression and use of wildland fire, including both prescribed and natural ignitions, to regulate hazardous fuels and move or maintain forest ecosystems toward desired conditions. Wildland fire management assists in achieving ecosystem sustainability including the interrelated ecological, economic, and social components.

Management Approaches

Principal strategies and program priorities for wildfire, prescribed fire, and fuels management

Fire suppression actions are taken to mitigate effects of wildfire to public safety, communities, and unique resource values, while allowing unplanned ignitions to play a natural role in fire-dependent ecosystems.

Wildfire is recognized as a tool to accomplish multiple objectives. Wildfires caused by natural ignitions are managed for multiple resource objectives, including resource benefit when conditions are favorable.

The use of appropriate and authorized hazardous fuels reduction tools, including but not limited to grazing, mechanical treatments, prescribed fire, or naturally ignited wildfires, to meet ecosystem needs and reduce vegetation build-up is intended to lower the risk to communities and other values from damage or loss from wildfire.

Prescribed fire is an appropriate tool to dispose of slash and return nutrients and woody debris to soils while reducing hazardous fuels. This can be integrated into wildlife habitat and forage improvement, and seedbed preparation for natural regeneration.

Fire Management Zones

Two strategic fire management zones were developed that closely correspond to management area boundaries. Additional direction may be needed depending on the site-specific conditions. Assigning strategic fire management zones supports decision-making prior to ignition by pre-assessing areas for wildland fire risks and benefits, for both prescribed fire and wildfire. Fire management zones include:

- Wildland fire management zone: resource restoration (WFMZ-R) and
- Wildland fire management zone: resource protection and benefit (WFMZ-PB).

Wildland Fire Management Zone: Resource Restoration (WFMZ-R)

This zone applies to Designated Wilderness, Recommended Wilderness, and Roadless Management Areas (MA 1, MA 1.1, and MA 3). These areas represent a lower risk to resource values from wildfire. Conditions allow natural resources to benefit from wildland fire. Management of wildfire to meet resource objectives in this zone is the least constrained. Ecological restoration is accomplished by managing wildland fire under a wide range of weather, fuel moisture, and other environmental conditions that allow fire to play a natural role in the ecosystem. The use of prescribed fire to meet specific resource objectives is appropriate in this zone. All naturally occurring wildfires in these areas are managed primarily to restore and maintain the natural role of fire in the ecosystem with a minimal emphasis on suppression. However, if a wildfire ignites in an area of this zone where a community or infrastructure value is threatened, suppression action will be taken to mitigate the effects. Human-caused wildfires are managed using a full suppression strategy commensurate with the values at risk.

Wildland Fire Management Zone: Resource Protection and Benefit (WFMZ-PB)

This zone applies to all other areas of the Forest, including the General Forest and Rangeland and all Special Designation Management Areas (MAs 5, 4.1, 4.2, 4.21, 4.34, and 4.8). Current conditions may put some natural resource values at varying degrees of risk of damage from wildfire. Mechanical treatments and prescribed burning may be used to protect natural resource values before using wildfire under a wider range of weather, fuel moisture, and other environmental conditions. Wildfires that burn in this zone may benefit natural resources under certain conditions. All lightning-caused wildfires in these areas will be assessed on an individual basis for the most appropriate response based on values at risk and potential benefits to natural resources from wildfire. All human-caused unplanned wildfires are managed using a full suppression strategy commensurate with the values at risk.



Figure 6. West Fork Fire, June 2013

Desired Conditions

DC-FIRE-1: Wildland fire and fuels reduction treatments are used to create vegetation conditions that reduce threats to real property and infrastructure from wildfire. Fuel loads on lands adjacent to developed areas and communities are reduced. Lands adjacent to private property and infrastructure have defensible space and dispersed patterns of fuel conditions that would favorably modify wildfire behavior and reduce the rate of spread in and around communities at risk. (Forestwide)

DC-FIRE-2: Natural ignitions play a natural role in ecosystem dynamics when and where there is no threat to human life or property. (Forestwide)

Objectives

Refer to *Vegetation Management* section.

Standards

S-FIRE-1: Unplanned human-caused ignitions will not be managed for resource benefit. (Forestwide)

S-FIRE-2: Fire control lines will be rehabilitated to prevent use as trails and/or roads. (Forestwide)

Insects and Disease (INDS)

Insects and disease can cause major disturbances to the ecological processes that shape the condition of forests. Insects and diseases play an important role in the natural cycles of forest growth and decline. Without the influence of change agents such as fire, insects, and disease, the forest would stagnate and eventually become homogeneous, with a resultant negative impact on biodiversity and resilience to disturbance. These change agents are an integral part of forest ecosystem processes, but still pose a challenge to forest management. The scale of the recent bark beetle outbreak has created significant management challenges that are addressed throughout this forest plan.

Many plan components, including standards and guidelines associated with insects and disease management, are contained in other sections of this forest plan, including but not limited to *Vegetation*, *Pollinators*, and *Wildlife*, along with specific direction for management areas: *Wilderness*, *Research Natural Areas*, *Colorado Roadless Areas*, *Dispersed and Developed Recreation*, and *Ski-based Resorts*.

Management Approaches

Principal strategies and program priorities to address insects and disease that are not covered in other areas of the forest plan

Vegetation in high-use recreation areas is managed to ensure public safety and improve forest health in alignment with the desired recreational setting.

Integrated pest management techniques are employed to meet resource objectives. Treatment activities consider the values present and risks to adjacent lands, both public and private. Priority is given to areas where value to be protected exceeds the costs of protection. An example is recreation sites or areas of concentrated public use that are adjacent to subdivisions.

Project activities are designed to minimize the risk of spreading existing infestations, while still providing habitat conditions for wildlife and plant species dependent on the presence of insects and disease.

Range Management (RNG)

Rangelands are all lands producing, or capable of producing, native forage for grazing and browsing animals, and lands that have been revegetated naturally or artificially to provide a forage cover that is managed like native vegetation. They include all grasslands, forb lands, and shrublands, and those forested lands that can, continually or periodically, naturally or through management, support an understory of herbaceous or shrubby vegetation that is forage for grazing or browsing animals. Rangelands on the Forest are naturally fragmented because of highly dissected mountain slopes and changes in vegetation as elevation changes.

A forest plan identifies areas suitable and capable for livestock, and assigns standards and guidelines specific to range management for those areas. The 2002 amendment to the 1996 forest plan serves as this basis, and projects a capacity for livestock grazing at 143,000 head months, including cattle and sheep. An estimated 581,000 acres of land are considered capable and suitable for domestic livestock grazing on the Forest.

Livestock-based agriculture is historically and culturally important in the San Luis Valley and southwestern Colorado. Agriculture, particularly farming and ranching, continues to be an

important industry. Domestic livestock grazing contributes to the stability of the surrounding ranching community and its values are recognized as a part of the heritage, for contributions to food and fiber, and for maintenance of open space. While the range allotments on the Forest are not the exclusive source of feed for the permitted stock, they provide important high-elevation forage during the summer months. This forage supplements private and leased pasture, and allows the permittees to maintain current livestock numbers.

Management Approaches

Principal strategies and program priorities to address continued and sustained range management

When allowable-use criteria, allotment management plan guidance, or annual operating instructions have been exceeded, all other solutions are extensively considered before removing livestock from the grazing unit or allotment. Damage from allowable use can result from many other factors including but not limited to flooding, recreation, and wildlife. None of these other factors should push use beyond what is allowed.

Rangelands are managed to provide a wide variety of benefits, including forage for livestock and wildlife, a diversity of plant and animal communities, and high-quality water.

Grazing administration will discourage livestock use in openings created by fire or timber harvest that would delay successful regeneration of the shrubs and trees, and in sensitive riparian, wetland, and spring ecosystems.

Allotments may be vacated but are generally not closed except in extreme circumstances and conditions.

Work is coordinated with cooperators, partners, and permittees to prioritize and restore upland ecosystems and rebuild important structural improvements.

Desired Conditions

DC-RNG-1: Domestic livestock grazing is managed to promote landscape diversity (composition, structure, and function) with both a spatial context (what species, what kind of structure, and what landscape patterns are natural for each ecosystem) and a temporal context (which seral stages and how many are natural for each ecosystem). (Forestwide)

DC-RNG-2: Forage, browse, and cover needs for wildlife and authorized livestock are in balance with available forage. (Forestwide)

DC-RNG-3: Temporary forage is available for grazing within existing, permitted allotments in coordination with other resource needs, e.g., reforestation. (Forestwide)

DC-RNG-4: Range improvements support ecologically sustainable grazing and benefits for wildlife when opportunities exist. New and replacement improvements are designed to benefit aquatic and terrestrial species. (Forestwide)

Objectives

OBJ-RNG-1: Restore 150 acres of upland ecosystems over the next 15 years. (Forestwide)

Guidelines

G-RNG-1: Develop site- and species-specific vegetation use and residue guidelines during rangeland planning, and document them in allotment management plans. In the absence of updated planning or an approved allotment management plan, the utilization and residue guidelines in Table 1 and Table 2 will apply. (Forestwide)

Table 1. Utilization guidelines for rangeland condition

Type of Management	Satisfactory (percent)	Unsatisfactory (percent)
Season-long	35	20
Fall and winter	55	35
Deferred rotation	45	25
Rest rotation	50	35

Table 2. Clary and Webster residue allowances for rangeland

Season of Pasture Use	Satisfactory (inches)	Unsatisfactory (inches)
Spring	3	4
Summer and fall	4	6

G-RNG-2: Authorized grazing should not occur on an individual unit for the entire vegetative-growth period. This would be acceptable when the grazing system involves complete rest for that unit for two or more years after a full growing season treatment. (Forestwide)

G-RNG-3: Authorized grazing in riparian management zones and groundwater dependent ecosystems should be in compliance with residual stubble heights identified in Forest Service Technical Report INT-263, *Managing Grazing of Riparian Areas in the Intermountain Region* (Clary and Webster 1996). (Forestwide)

G-RNG-4: Authorized grazing in aspen stands should ensure sprouting and sprout survival to perpetuate the long-term persistence of the clones, unless elimination of the clone is planned. (Forestwide)

Land Suitability

SUIT-RNG-1: Grazing in national forest wilderness areas is authorized by the Congressional Grazing Guidelines (§108, P.L. 96-560, H.R. Report 96-617 dated 11/14/79). Grazing authorizations would be included as part of any legislation on Management Area 1.1a, Recommended Wilderness. However, the acres of recommended wilderness are not currently grazed.

Soils (SOIL)

Soils are a foundational and integral part of ecosystems and the services they provide. Soils provide ecosystem goods and services such as clean drinking water and forest products such as timber and firewood, and provide areas for cattle grazing and recreational opportunities. Healthy,

sustainable soils will continue to provide these important ecosystem goods and services into the future. Effects of changes in temperature, and frequency and timing of weather events, can be mitigated in the short term if healthy soils are present. Soils have generally improved over time. Areas with needs for improvement still exist, but soils are mostly in acceptable or good condition in areas of high use and in excellent condition in designated roadless and wilderness areas.

Management Approaches

Principal strategies and program priorities to protect soil resources

Forest programs use genetically appropriate, weed-free seed mixes for revegetation to avoid potential for increasing nonnative invasive species or noxious weeds. Nonnative annuals or sterile perennial species can also be used while native perennials become established.

Forest programs identify and mitigate impacts to soil types that support edaphic plant species of conservation concern during project implementation. These soils include volcanic substrates such as ash-tuffs, latitic lava flows, rhyolite, and andesitic substrates. Sedimentary substrates supportive of edaphic species include calcareous substrates such as limestone and shale.

Soil resources are best protected with site-specific, project-level design and analysis.

Desired Conditions

DC-SOIL-1: Occasional, intermittent, small-scale soil disturbance occurs, allowing propagation of plant species including some species of conservation concern. (Forestwide)

Standards

S-SOIL-1: Manage land treatments to limit severely burned, compacted, eroded, and displaced soil to no more than 15 percent of an activity area, as described in the Watershed Condition Handbook (2509.25, Region 2 Supplement). (Forestwide)

Guidelines

G-SOIL-1: Maintain soil and slope stability where ground-disturbing activities on soils with high erosion rates or mass movement potential are authorized. Where practical, do not authorize activities on soils with high mass movement potential. (Forestwide)

Species of Conservation Concern (SCC)

Species of conservation concern (Appendix D) are animals or plants known to occur in the planning area that the regional forester has determined that the best available scientific information indicates a substantial concern regarding the species' ability to persist over the long-term (36 CFR 219.9). Many of the plan components that contribute to the maintenance or restoration of ecological conditions to contribute to maintaining a viable population of the species of conservation concern are also addressed in other sections including, but not limited to, *Riparian Management Zones*, *Range Management*, *Native Animals and Plants*, and *Species of Conservation Concern*. The full list of species of conservation concern and those species considered but not carried forward is contained in Appendix D.

Management Approaches

Principal strategies and program priorities assist in conservation of species of conservation concern

Forest programs mitigate impacts to insect species that are listed as species of conservation concern and their habitat, or that are necessary to those species as pollinators or as food, from applications of insecticide or other pesticides. To inform project-level planning on avoiding impacts to these species, the range and distribution of at-risk insect species (threatened, endangered, proposed, or candidate species and species of conservation concern) are assessed.

Forest programs mitigate impacts to plant species that are listed as species of conservation concern and their habitat, or that are necessary for those species as food (including grazing, forage, and nectar for pollinators) or cover, from herbicide or other pesticides.

Forest programs mitigate impacts to fish and aquatic species that are listed as species of conservation concern and their habitat, or that are necessary for those species to maintain aquatic organism passage and minimize fragmentation of habitat, except when needed to protect populations from undesired nonnative fish.

Forest programs provide education and awareness information regarding potential disease transmission between recreational pack goats and bighorn sheep at entry points to areas of known bighorn sheep use. Areas of overlapping pack goat and bighorn sheep use are observed over time.

Boreal toad education and outreach materials provide information regarding chytrid fungus. Where the fungus has been detected, the Forest will determine the need to implement decontamination procedures to protect boreal toads and other amphibians.

Desired Conditions

DC-SCC-1: Structure, composition, and function of sagebrush ecosystems meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-2: Structure, composition, and function of coniferous forests, including late seral forests, meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-3: Structure, composition, and function of riparian areas, including streams, willow thickets, and cottonwood galleries, meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-4: Structure, composition, and function of aspen-dominated forests meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-5: Structure, composition, and function of alpine ecosystems, including cushion plant communities, snow willow, alpine fell fields, and talus slopes, meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-6: Snags and decaying wood processes meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-7: Structure, composition, and function of montane grasslands meet the needs of associated species, including species of conservation concern. (Forestwide)

DC-SCC-8: Improve or maintain habitat for bighorn sheep. (Forestwide)

DC-SCC-9: Maintain effective separation to reduce the likelihood of interaction and risk of disease transmission between domestic sheep and bighorn sheep on active grazing allotments. (Forestwide)

Standards

S-SCC-1: Maintain effective separation of domestic sheep and bighorn sheep on active grazing allotments to reduce the likelihood and risk of disease transmission. Effective separation is defined as spatial or temporal separation between bighorn sheep and domestic sheep, resulting in minimal risk of contact and subsequent transmission of respiratory pathogens between animal groups. (Forestwide)

S-SCC-2: Do not authorize projects that will result in displacement of bighorn sheep during their reproductive period (generally April 15 to July 1). (Forestwide)

S-SCC-3: Prohibit the use of recreational pack goats in the Sangre de Cristo Mountains to eliminate potential interactions between pack goats and bighorn sheep. (Forestwide)

S-SCC-4: Maintain effective separation between domestic goats used for vegetation management and bighorn sheep to reduce the likelihood of contact between animal groups. (Forestwide)



Figure 7. Ptarmigan reside in the high mountains, generally above timber line

Guidelines

G-SCC-1: To maintain ecological conditions to support a viable population of species of conservation concern insects and plants, minimize negative impacts to pollinators when applying pesticides. (Forestwide)

G-SCC-2: To maintain ecological conditions to support a viability of species of conservation concern, roads and other permanent ground-disturbing structures and other authorized activities should not degrade vegetation within 100 feet of where plants that are listed as species of conservation concern are known to occur. Such barren or rocky areas include, but are not limited to, alpine fell fields, alpine cushion plant communities, talus slopes at any elevation, rock fields, boulder gardens, cliff faces, recently disturbed soils, exposed shale, gypsum, volcanic, or adobe soils, and other sparsely vegetated areas within other ecosystems.(Forestwide)

G-SCC-3: To maintain viability of species of conservation concern, reduce habitat fragmentation and maintain structural conditions of sagebrush ecosystems through design of management activities. Patch sizes should not be less than 5 acres. (Forestwide)

G-SCC-4: To maintain ecological conditions to support alpine-related species of conservation concern, avoid road construction and other permanent ground-disturbing activities within 100 feet of alpine fell and talus rock fields, and alpine bogs. (Forestwide)

G-SCC-5: To maintain habitat for bat species of conservation concern, retain adequate access for bats and reduce disturbance to resident populations when considering mine or cave closures. (Forestwide).

Threatened, Endangered, Proposed, and Candidate Species (TEPC)

Plan direction is designed to protect and recover animal and plant species that are listed as threatened or endangered under the Endangered Species Act, or those species that have been proposed or are candidates for listing. Threatened, endangered, proposed, and candidate species can occur anywhere on the Forest. These species can be influenced by direction that occurs throughout the forest plan, including but not limited to direction for wildlife, range management, and vegetation management.

Eight of approximately 300 total species are potentially affected by plan activities on the Forest are federally recognized as threatened or endangered species. These include black-footed ferret (endangered), Canada lynx (threatened), Gunnison sage grouse (threatened), Mexican spotted owl (threatened), New Mexico meadow jumping mouse (endangered), southwestern willow flycatcher (endangered), Uncompahgre fritillary butterfly (endangered), and yellow-billed cuckoo (threatened). None of these species currently have listed or proposed critical habitat on the Forest.

Of the eight listed species, the Uncompahgre fritillary butterfly, Canada lynx, Gunnison sage grouse, and southwestern willow flycatcher are known to occur in the planning unit.

Canada Lynx

The 2008 Southern Rockies Lynx Amendment Record of Decision amended eight forest plans, including the Forest. The direction prescribed in the 2008 Southern Rockies Lynx Amendment (Appendix E) is incorporated, as modified below, into the current direction and would apply Forestwide. Additional direction and modifications of the 2008 direction is needed to sufficiently

address the continued recovery of Canada lynx due to the current habitat conditions associated with the spruce beetle outbreak in the spruce-fir ecosystem. This direction amends and modifies management direction related to salvage in the Southern Rockies Lynx Amendment, specifically VEG S1 and VEG S2.

Even with higher levels of mortality due to spruce beetle infestation, high quality lynx and snowshoe hare habitat persists and vegetation management activities have the potential to benefit and adversely affect lynx and snowshoe hare habitat and populations (ILBT 2013, p. 71). Most vegetation management activities reduce canopy cover and horizontal cover in the understory, which could reduce snowshoe hare densities and habitat values for Canada lynx.

The direction below is intended to encourage vegetation management in areas where habitat quality for lynx and snowshoe hare can be improved while retaining existing high quality habitat. The overall goal is to maintain areas that support high densities of snowshoe hare while promoting vegetation management that restores habitat and landscape connectivity for lynx movement.

The Southern Rockies Lynx Amendment direction was developed prior to the 2012 Planning Rule. Standard VEG S7 is formatted to be consistent with the forest plan and similar to the Southern Rockies Lynx direction. The direction in the Southern Rockies Lynx Amendment is formatted differently than direction contained in this forest plan. Superscript numbers in the text refer to definitions contained in the Southern Rockies Lynx Amendment in Appendix E.

Standard VEG S7 (below) applies to salvage harvest activities conducted in conifer forests that have lynx habitat attributes, but no longer meet the definition for standard VEG S6 due to tree mortality and associated forest structural changes. These stands still provide high quality lynx habitat and are characterized by dense horizontal cover, and include forest structure that provides cover and food for snowshoe hares, and foraging habitat, traveling, and hiding cover for Canada lynx. According to a recent study completed on the Forest (Squires et al. 2018), stands with Engelmann spruce and subalpine fir in the canopy, and subalpine fir in the sub-canopy are disproportionality selected by lynx. Stands where standard VEG S7 would apply continue to support snowshoe hare and secondary prey species, such as red squirrels, particularly when live vegetation and horizontal structure is present.

Salvage harvest in lynx habitat is prioritized as follows:

1. Choose areas with good habitat restoration potential that currently exhibit poor quality lynx habitat condition, (i.e., horizontal cover density less than 25 percent, subalpine fir is a minor component of the sub-canopy, favorable site conditions, and best available science suggest that conditions could be improved through vegetation management);
2. Choose areas that provide poor quality lynx habitat and poor habitat restoration potential;
3. All other areas based on overall project considerations and needs.

Stands that are subject to VEG S7 represent high-quality habitat for lynx and are confined to the high probability lynx use area (95 percent areas) delineated in the Resource Selection Function model for the Forest (Squires et al. 2018). The High Probability Lynx Use Area Map can be found on the external drive of maps located in the back of the document. These areas are identified as having:

- Overstories that are predominantly live or dead Engelmann spruce and subalpine fir, or either species, with sub canopy layers dominated by subalpine fir, or a combination of either Engelmann spruce or aspen, or both; and
- Total live overstory canopy cover less than or equal to 40 percent; and
- Understory horizontal cover density from ground level to 3 meters above ground level is greater than or equal to 45 percent during winter foraging conditions for snowshoe hares.

Openings in lynx habitat are areas with less than 25 percent total canopy closure. Areas with less than 25 percent horizontal cover are not considered suitable habitat.

During salvage project design, late-successional forest patches that are expected to remain green or mostly green in the next 15 years are identified for retention during project implementation. Foresters and wildlife biologists determine the optimal landscape heterogeneity objectives that include retention, opening patch size, and configuration. Project objectives should be considered at a watershed or sub-watershed scale, using the best available science.

Forest stands that meet the VEG S7 definition represent a disproportionately high value subset of the overall suitable habitat in a lynx analysis unit. Management prioritization provides limited entry allowances into VEG S7 stands. A 7 percent allowance into VEG S7 stands is available for use within 15 years of the decision date for this forest plan. Suitable lynx habitat is defined as stands with understory horizontal cover density greater than 25 percent. Timber stands subject to VEG S7 in locations that are documented as occupied by lynx and may support reproduction (Ivan 2018) should be avoided where possible. If entry does occur, minimize further reduction in key habitat values.

The VEG S7 standard is associated with a management prioritization focus that supports limited entry into VEG S7 stands while promoting forest restoration in stands that may be improved by understory regeneration. The prioritization focus for vegetation management activities for non-VEG S7 stand and non-hazard trees, in the 95 percent lynx use area is as follows:

1. Activities in stands with 0 to 24 percent horizontal cover density (unsuitable habitat) and high site potential for active habitat improvement;
2. Activities in areas of 0 to 24 percent horizontal cover density (unsuitable habitat) with poor potential for further improvements in habitat values;
3. Activities in areas of 25 to 44 percent horizontal cover density (suitable but not high quality).

Hazard tree removal along open and administrative use roads, trails, and campgrounds is exempt from this direction. Removing hazard trees from these locations is done to maintain safety for the public and employees. This treatment may occur up to 250 feet from open and administrative use roads, trails, and campground boundaries.

Desired Conditions

DC-TEPC-1: Maintain or improve habitat conditions that contribute to either stability or recovery, or both, for threatened, endangered, proposed, and candidate species. (Forestwide)

Desired conditions related to habitat for Canada lynx are specified in the Southern Rockies Lynx Amendment.

Standards

S-TEPC-1: The Southern Rockies Lynx Amendment direction (Appendix E), as amended and modified by the forest plan record of decision, shall be applied. (Forestwide)

S-TEPC-2 (VEG S7): Salvage activities in stands that represent high quality lynx habitat may occur in up to 7 percent of the high-probability lynx use area (95 percent lynx use areas shown on the High Probability Lynx Use Area Map) that overlaps the suitable timber base 15 years from the date on the forest plan decision. Salvage activities in VEG S7 stands in combination with all vegetation management activities, including incidental damage resulting in either Stand Initiation Structural Stage conditions, a reduction of horizontal cover, or both, are tracked for 15 years from the decision date for this forest plan decision.

S-TEPC-3: Southern Rockies Lynx Amendment standards VEG S1 and VEG S2 do not apply on lynx analysis units that have no overlap, either wholly or partially, with the high probability lynx use areas shown on the High Probability Lynx Use Area Map. All other management direction (excluding VEG S1 and VEG S2) in the Southern Rockies Lynx Amendment applies to areas outside of the high probability lynx use areas (95 percent use area).

Guidelines

G-TEPC-1: To avoid or minimize adverse effects to listed species and their habitat, management actions should be designed with attention to threatened, endangered, proposed, or candidate species and their habitats. (Forestwide)

Vegetation Management (VEG)

The Forest provides a diverse landscape with a wide variety of vegetation communities. The majority of the Forest is in the spruce-fir ecosystem. Other vegetation types that dominate include the Southern Rocky Mountain montane-subalpine grassland and Rocky Mountain alpine turf, followed by mixed-conifer, dry, and pinyon-juniper woodland.

Plan components contained in the section below cover the broad area of forest vegetation and management of forest vegetation. The direction includes plan components related to terrestrial ecosystem integrity, as well as the required timber harvest-related plan components, as described within Chapter 60 of Forest Service Handbook 1909.12. Most plan components in this section were designed using the natural range of variation described in the 1996 Forest Plan (Appendix A), which was used to define the key ecosystem characteristics in the Terrestrial Ecosystem Assessment.

Plan components that affect vegetation are also contained in other sections of this forest plan including, but not limited to, *Fire, Insects and Disease, Minerals, Nonnative Invasive Species and Noxious Weeds, Range Management, Riparian Management Zones, Soils, Species of Conservation Concern, Visual Quality, Watersheds, and Wildlife*. Specific direction is also contained for management areas: *Wilderness, Dispersed and Developed Recreation, General Forest and Intermingled Rangelands, Roadless Areas, Scenic Byways and Scenic Railroads, and Special Interest Areas*.

Project-level timber harvest objectives are formulated during site-specific analysis and are in compliance with forest plan direction presented here. In areas that are suitable for timber production, dead or dying trees are salvaged to recover the economic value of the wood while

providing for ecosystem function. Management of ecosystem function includes, among other activities, retention of snags and downed woody material, and habitat management. In addition, snags are managed for public safety.

Key ecosystem characteristics are defined in the 2012 Planning Rule as the dominant ecological components that describe the ecosystems and are relevant and meaningful for addressing ecological condition and integrity, as well as important land management concerns. Ecosystem integrity as related to vegetation is typically assessed by considering dominant ecosystem functions, composition, structure, and connectivity. Key ecosystem characteristics are measurable, qualitatively or quantitatively, and there is some type of data or means to distinguish and describe them. Key ecosystem characteristics have been identified and are listed below:

- Diversity of vegetation
- Late-successional and old forest habitats
- Snags and downed woody material
- Landscape disturbance and patterns
- Rare communities and special habitats
- Connectivity.

The forest and nonforested ecosystems as described in the assessment reports prepared during the forest plan revision process are listed in Table 3. Corporate vegetation databases classify forest areas by local cover types. A crosswalk between the ecosystems defined in Table 3 and the current distribution of local cover types is presented in Table 4.

Table 3. Forest and nonforested ecosystems, as described in the assessment reports

Ecosystem	National Forest System Acres	Percentage
Spruce-fir forest mix	929,645	54
Mixed conifer-wet	42,718	2
Mixed conifer-dry	94,925	5
Rocky Mountain alpine turf	191,800	11
Pinyon-juniper woodland (includes low elevation grasslands)	100,700	6
Rocky Mountain Gambel oak – mixed montane shrubland	1,224	Less than 1
Southern Rocky Mountain montane – subalpine grassland	304,136	18
Rocky Mountain montane riparian	61932	4
Sagebrush shrubland	5014	Less than 1
Intermountain basins greasewood flat	128	Less than 1

Table 4. Crosswalk between ecosystems and FSVEG spatial local cover types

Ecosystem	Local Cover Type in FSVEG spatial
Spruce-fir forest mix	Spruce-fir forest (TSF) Aspen forest (TAA) Aspen forest with softwoods present (TAA-SW) Lodgepole pine forest (TLP)

Ecosystem	Local Cover Type in FSVEG spatial
Mixed conifer-wet	Mixed conifer forest – cool-moist (TMC-CM) Aspen forest (TAA) Aspen forest with softwoods present (TAA-SW)
Mixed conifer-dry	Mixed conifer forest – warm-dry (TMX-WD) Ponderosa pine forest (TPP-PP) Mixed conifer forest – cool-dry (TMC-CD) Bristlecone pine/limber pine forest (TBC_LI)
Rocky Mountain alpine turf	Alpine vegetation (ALP)
Pinyon-juniper woodland (include low elevation grasslands)	Pinyon-juniper woodland (TPJ)
Rocky Mountain Gambel oak – mixed montane shrubland	Mountain shrubland (MT_SHR) Semi-desert shrubland (DS_SHR) Non-riparian willow (UP_SWI)
Southern Rocky Mountain montane – subalpine grassland	Mountain grassland (MT_GRA) Semi-desert grassland (DS_GRA)
Rocky Mountain montane riparian	Riparian vegetation (RIP)
Sagebrush shrubland	Sagebrush shrubland (SSA)
Intermountain Basins greasewood flat	Not applicable

Management Approaches

Principal strategies and program priorities for timber and vegetation management

Special forest products include materials that are not traditional timber and fiber products, such as sawtimber or house logs. Special forest products are permitted (or contracted) for removal from public lands for commercial, personal, Native American tribal, educational, or scientific purposes. Plan components in this section cover a variety of special forest products, including but not limited to building rock, craft products, firewood, floral and greenery products herb and vegetable products, landscaping products, medicinal and pharmaceutical products, wild berries and fruit, and wild edible mushrooms.

The Forest continues to identify and map populations of *Ligusticum porteri*. Following mapping, the Forest will consider setting aside collection areas for tribal use and rotating the use of these areas over time.

Vegetation treatments generally avoid alteration of the edge of natural openings.

Competition for water, nutrients, and light among the trees is considered when choosing thinning methods, with the goal of restoring or maintaining genetic diversity. Frequency of thinning is dependent on species, financial efficiency, and growing conditions of the site, commonly measured by site index.

Project-level planning uses criteria in Appendix A to determine the presence of old forest. The habitat is assessed for quality and distribution and retained as necessary for vegetative diversity.

Management-created openings are no longer considered openings when the trees reach a height and density that meet management objectives. The default criteria are when the minimum stocking standards for the forest vegetation type on suitable lands are met and average height is 6 feet or greater with at least a 70-percent distribution for conifer species, and 10 feet or greater

with at least a 70-percent distribution for aspen. The criteria are validated and may be modified in accordance with local conditions.

Forest vegetation management that results in meeting the needs or demand for forest product offerings for commercial, personal, or other use is done in a manner that supports one or more of the following:

- Maintains or improves ecosystem function, resilience, and sustainability,
- Supports a sustainable level of economic activity in the local timber industry,
- Provides economic or social support to local communities,
- Ensures current and future needs for American Indian tribal use, including that associated with special forest products (e.g., teepee poles),
- Uses, to the fullest extent practicable, potential products including saw timber, poles, top wood, or slash,
- Supports innovation in utilization, including conversion of cut tree mass into biofuels, pellets, biochar, or other useful products,
- Efficiently balances or reduces costs of implementation of treatment activities, and
- Anticipates climate-related change in plant succession, such as favoring heat- or drought-resistant tree species as leave trees.

In areas suitable for timber production, dead or dying trees due to fire, insects, or disease are salvaged to recover the economic value of the wood while providing for ecosystem function. This will be the primary focus of the timber program for the first three years of the planning period.

The scientifically defined silvicultural systems shown by forest cover type in Table 5 meet the management objectives for the landscape or individual stands of trees within a landscape setting. Both even-aged and uneven-aged management systems can be used and applied at scales ranging from a few acres to many hundreds of acres. These silvicultural systems are to be applied in a manner that will create conditions favorable for natural regeneration. Artificial regeneration will be considered when necessary to meet minimum stocking standards. The silvicultural systems identified in Table 5 can be used to convert uneven-aged stands to even-aged management and even-aged stands to uneven-aged management.

Table 5. Appropriate silvicultural system by cover type

Forest Cover Type	Even-Aged	Two-Aged	Uneven-Aged
Ponderosa pine	Shelterwood, clearcut, overstory removal, seed tree	Irregular shelterwood, shelterwood with reserves	Group selection, single-tree selection
Mixed-conifer	Shelterwood, clearcut, overstory removal, seed tree	Irregular shelterwood, shelterwood with reserves	Group selection, single-tree selection
Aspen	Coppice ¹	Coppice with standards ²	Group selection ³
Lodgepole pine	Shelterwood, clearcut, overstory removal, seed tree	Irregular shelterwood	Group selection

Forest Cover Type	Even-Aged	Two-Aged	Uneven-Aged
Engelmann spruce and subalpine fir	Shelterwood, clearcut, overstory removal	Irregular shelterwood	Group selection, single-tree selection

¹ Coppice is a vegetation reproduction method with clearfelling or clearcutting. Clearfelling (clearcutting) stimulates sprouting from the residual roots.

² “Standards” are selected overstory trees reserved for a longer rotation at the time each crop of coppice material is cut.

³ Use of group selection as an appropriate silvicultural system in aspen is currently under study to determine regeneration success, but is authorized on a test basis.

Aspen is encouraged and promoted on the landscape. When regenerating aspen, treatments within seral aspen clones are prioritized with the following criteria:

- Identify stands with large standing and down dead basal area (about 20-percent dead) that are single-storied and showing signs of animal barking (gnawing and bark stripping) or disease. Multistoried stands that have several hundred sapling-size suckers per acre under them, or that show little sign of canker disease or animal barking, are lower priority for any management intervention.
- Identify conifer stands with a small minority of live aspen basal area (less than 20-percent live basal area). (Aspen is likely to disappear from these stands within several decades without intervention).
- Identify isolated clones and stands in areas frequented by animals and in riparian areas, and those at low elevations. Any stands in these situations that meet the criteria above should be given the highest priority for regeneration. (These stands will be at greatest risk of disappearing and will be the most difficult to regenerate successfully. Protection of treatment areas from browsing animals may be needed to achieve successful regeneration.)
- Identify stands that are more cost efficient and not impacted by frequent animal use to treat and contribute positively to the distribution of aspen.

The size of uncut forest areas between openings is based on project-level management objectives for the landscape being analyzed.

Desired Conditions

DC-VEG-1: Commercial timber harvest occurs on lands identified as not suitable for timber to meet multiple use objectives and for safety and health. These harvests are not part of the regularly scheduled harvest program. These activities meet management direction and desired conditions and may provide other services and benefits. (Forestwide)

DC-VEG-2: Habitat structure in Gambel oak communities provides for the needs of associated species. (Forestwide)

DC-VEG-3: All development stages of the forested terrestrial ecosystems are well represented at the landscape scale and occur Forestwide within the ranges identified in Table 6. (Forestwide)

Table 6. Current status and desired conditions of development and structural stages of the forested terrestrial ecosystems

Terrestrial Ecosystem	Development Stage	Structural Stage	Current Condition (percentage)	Desired Condition (percentage)	Desired Condition in Old Forest (percentage)
Ponderosa pine	Young	1T/2T	8	5–10	10–15
	Mid-open	3A	19	5–10	
	Mid-closed	3B, C	5	5–10	
	Mature-open	4A	49	40–50	
	Mature-closed	4B, C	19	15–25	
Warm-dry mixed-conifer	Young	1T/2T	<1	5–10	15–20
	Mid-open	3A	6	10–15	
	Mid-closed	3B, C	8	10–15	
	Mature-open	4A	34	25–30	
	Mature-closed	4B, C	52	25–35	
Cool-moist mixed-conifer	Young	1T/2T	8	5–10	20–30
	Mid-open	3A	10	5–10	
	Mid-closed	3B, C	22	15–20	
	Mature-open	4A	17	15–20	
	Mature-closed	4B, C	43	30–40	
Cool-dry mixed-conifer	Young	1T/2T	0	5–10	15–20
	Mid-open	3A	12	5–10	
	Mid-closed	3B, C	24	15–20	
	Mature-open	4A	25	30–40	
	Mature-closed	4B, C	39	15–20	
Spruce-fir	Young	1T/2T	30	5–10	25–35
	Mid-open	3A	13	5–10	
	Mid-closed	3B, C	7	10–15	
	Mature-open	4A	27	20–25	
	Mature-closed	4B, C	22	30–40	
Aspen	Young	1T/2T	6		
	Mid-open	3A	16		
	Mid-closed	3B, C	58		
	Mature-open	4A	2		
	Mature-closed	4B, C	19		
Pinyon-juniper woodland	Young	1T/2T	1	5–10	20–30
	Mid-open	3A	47	10–15	
	Mid-closed	3B, C	38	10–15	
	Mature-open	4A	5	20–30	
	Mature-closed	4B, C	9	30–40	

Objectives

OBJ-VEG-1: Diversify the structure class distribution for various forest types by managing 800 acres annually in years 4 and 5 of the planning period and 1,200 acres in years 6 through 20 of the planning period, to work toward or maintain the desired conditions in Table 6. (Forestwide)

OBJ-VEG-2: Annually restore 150 to 300 acres of dry mixed-conifer and ponderosa pine areas to move these forest types toward a species composition and landscape pattern where fire can function in its natural role. (Forestwide)

OBJ-VEG-3: Salvage harvest approximately 62,800 CCF (hundred cubic feet) of spruce-fir annually for the first 3 years of the planning period. (Forestwide)

OBJ-VEG-4: Salvage harvest an estimated 20,000 CCF of spruce-fir annually during years 4 and 5 of the planning period. (Forestwide)

OBJ-VEG-5: Offer timber for sale at an average timber sale quantity of 8,000 CCF per year for years 4 and 5 of the planning period. Offer timber for sale at an average timber sale quantity of 12,000 CCF per year for years 6 through 20. (Forestwide)

OBJ-VEG-6: Identify and map a minimum of five select populations of ethnobotanically important plants for tribes in concert with the heritage, botany, and timber programs over the next 15 years. (Forestwide)

OBJ-VEG-7: Average 100 acres of hazardous fuels reduction per year in areas adjacent to private development, critical infrastructure, or both over the next 15 years. (Forestwide)

OBJ-VEG-8: Average 2,000 acres of fuels reduction per year using fire managed for resource benefit or prescribed fire on Forest lands over the next 15 years. (Forestwide)

*Specific to Objectives **OBJ-VEG-3**, **OBJ-VEG-4**, and **OBJ-VEG-5**: Estimates of timber outputs may be larger or smaller on an annual basis, or over the life of the plan, if legal authorities, management efficiencies, or unanticipated constraints change in the future.*

Standards

S-VEG-1: Timber may not be harvested for the purpose of timber production on lands not suited for timber production. Timber harvest may occur on these lands for the following purposes: protecting other multiple-use values, protecting or enhancing biodiversity or wildlife habitat, scenic-resource management, research, or administrative studies consistent with geographic or management area direction, and salvage, sanitation, public health, or safety. (Forestwide)

S-VEG-2: Timber shall not be harvested on lands where soil, slope, or other watershed conditions may be irreversibly damaged, as identified in project-specific findings. (Forestwide)

S-VEG-3: Timber harvest shall be conducted to assure that the technology and knowledge exist to restock these areas adequately with trees within five years after final harvest. (Forestwide)

Minimum restocking levels for suitable timber lands are defined in Table 7. Exceptions to these levels are allowed if supported by a project-specific determination of adequate restocking.

Restocking levels for unsuitable timber lands must be specified with the silvicultural prescription. Project-specific determination of adequate stocking must be based on the plan's

desired conditions and objectives applicable to the area and project and be consistent with all other applicable plan components. (Forestwide)

Table 7. Minimum restocking level for suitable timber lands, by species

	Species						
	Spruce-Fir	Aspen	Douglas Fir	Lodgepole Pine	Ponderosa Pine	Other Softwoods	Other Hardwoods
Trees per Acre	150	300	100	150	75	150	150

S-VEG-4: Select harvest systems to achieve desired conditions and objectives or to meet site-specific project needs, not primarily for the greatest dollar return or timber output.

S-VEG-5: Clearcutting may be used where it has been determined to be the optimum method, and other types of even-aged harvest shall be used only where determined to be appropriate following interdisciplinary review. Determinations shall be based on site-specific conditions and the desired conditions for vegetation, wildlife habitat, scenery, and other resources. (Forestwide)

S-VEG-6: Openings larger than 40 acres may only be created under one of the following conditions:

- Proposals for larger openings have been approved by the regional forester, following a 60-day public review,
- Areas harvested as a result of natural catastrophic conditions (including those resulting from fire, insects, diseases, and windstorms), or
- When the area that is cut does not meet the definition of openings. (Forestwide)

S-VEG-7: The quantity of timber that may be sold per decade will be less than or equal to the sustained yield limit of 737,490 CCF per decade with the following exceptions: salvage or sanitation harvesting of timber stands that are substantially damaged by fire, windthrow, or other catastrophe or that are in imminent danger from insect or disease attack. Salvage harvest of trees substantially damaged by fire, windthrow, or other catastrophe or in imminent danger from insect or disease attack may be harvested over and above the sustained yield limit, consistent with desired conditions for terrestrial and aquatic ecosystems. (Forestwide)

S-VEG-8: When there is a shortage of any special forest products for tribal use, commercial permits are issued only to the extent that tribal use can be accommodated. (Forestwide)

Guidelines

G-VEG-1: Snag densities are related to disturbance regimes of various forest systems. Snags suitable for nesting and denning (typically larger sizes) are present across the Forest contributing to the diversity of forest structure and maintenance of habitat components important to the persistence of snag-associated wildlife species. Snags provide an important habitat component in the maintenance of habitat connectivity. Snag-retention should represent a variety of snag heights. At least 50 percent of the retained snags should represent the larger size classes available. Where larger snags are not available, trend toward a greater number of smaller snags. Snags are not required to be maintained on every acre. (Forestwide)

Table 8. Recommended snags and downed wood for wildlife habitat and ecosystem processes

[All quantities are based on an average per acre basis across the planning unit.]

Forest Type	Snags			Downed Wood ¹
	Minimum diameter at breast height	Minimum/Acre in planning unit	Minimum height (feet)	Tons/Acre
Spruce-fir	² 12	6	25	10 to 15
Mixed-conifer	² 12	3 to 4	25	4 to 10
Aspen	10	5	25	3 to 5
Ponderosa pine	² 12	3	25	2 to 3
Lodgepole pine	10	3	15	5 to 10

¹ Project implementation should focus on leaving larger and longer logs onsite in accordance with site capacity.

² At least 50 percent of the required snag numbers should represent the largest size classes available.

G-VEG-2: Even-aged stands shall generally have reached or surpassed culmination of mean annual increment (achieving 95 percent of culmination of mean annual increment, as measured by cubic volume) prior to regeneration harvest, unless the following conditions have been identified during project development:

- When such harvesting would modify fire behavior to protect identified resource, social, or economic values
- When harvesting of stands will trend landscapes toward desired conditions
- When harvest uses uneven-aged silvicultural systems, thinning, or other intermediate stand treatments that do not regenerate even-aged or two-aged stands
- When harvest is for sanitation or salvage of timber stands that have been substantially damaged by fire, windthrow, or other catastrophe, or that are in imminent danger from insect or disease attack
- When harvest is on lands not suited for timber production and the type and frequency of harvest is due to the need to protect or restore multiple use values other than timber production. (Forestwide)

G-VEG-3: To maintain scenic resources, even-aged harvest openings should be irregularly shaped and blend with the natural terrain to the extent practicable. (Forestwide)

G-VEG-4: To maintain ecosystem conditions for continued persistence, permit the collection of species of conservation concern plants only for scientific, educational, or conservation purposes and only to the level that persistence of the species is maintained. (Forestwide)

G-VEG-5: Old forest, or late-successional stage forest, is often deferred from harvest to maintain biotic diversity across the landscape. To maintain old forest components across the landscape and move toward desired conditions (defined in Table 6) prioritize retention of old forest stands as follows:

- Older stands that have not been manipulated are more desirable than younger ones.
- Stands with limited use and access are better suited to maintain old forest conditions.

- Stands that provide habitat for threatened, endangered, or proposed species, species of conservation concern.
- Stands exhibiting a variety of attributes such as diverse canopy layers, decadence in live trees, standing or downed dead, or both, and patchiness.

Land Suitability

SUIT-VEG-1: Lands are identified as suitable for timber production in management area direction contained in Chapter 3. Even though lands may be identified as suitable for timber production, those lands may not be feasible for harvest. Feasibility is determined at the site-specific, project level. An estimated 499,936 acres of lands on the Forest have been determined as may be suitable for timber harvest.

Wildlife and Plants (WLDF)

Most of the wildlife species that inhabits the Forest is outside of the protections provided by the Endangered Species Act, as amended, and is not considered a species of conservation concern as defined in the 2012 Planning Rule. Plan components pertaining to these species are contained in this section. This direction maintains ecosystem integrity on a broad range of terrestrial habitats throughout the Forest, including all vegetation types. This includes all native species as well as any desirable nonnative species. Nearly all plan components have the potential to affect wildlife in some way.

Habitat connectivity can be viewed as the degree to which landscapes facilitate or impede the movement of species and ecological processes among suitable habitat patches (Taylor et al. 1993). Measurements for habitat connectivity involve both the physical attributes that might provide barriers to movement, such as roads and trails, and the vegetation or habitat structural changes and patterns that influence the ability of species to move across the landscape. Potential impacts from impaired connectivity can vary by species. Much of the Forest is bordered by public lands, and the landscape patterns contribute to the continuous nature of the landscape. For some species, such as Rocky Mountain elk, mule deer, and other game species, these landscape conditions will continue to facilitate historic game movement patterns within and among national forest lands and other public and private lands, including across state lines. Much of the land is designated wilderness or roadless, which will contribute to habitat connectivity and movement patterns for many species, particularly those that are sensitive to human disturbances. Additional protected areas occur on adjacent National Forest System lands as well as across state and administrative boundaries.

Sections below include direction for wildlife and plant species on the Rio Grande National Forest. Also included in this section is direction for *species of conservation concern* and direction for *threatened, endangered, proposed, and candidate species*.

Management Approaches

Principal strategies and program priorities to protect wildlife resources in addition to strategies and approaches under species of conservation concern; and threatened, endangered, proposed, and candidate species; and fisheries

Within fiscal capacity, the Forest continues to participate and support recovery and conservation efforts including but not limited to conservation agreements for Rio Grande cutthroat trout

(RGCTCT 2013), Rio Grande chub and Rio Grande sucker (RGCSCT 2018), fens, pollinators, Uncompahgre fritillary butterfly, bats, watershed condition priorities, prairie dogs, avian monitoring and conservation, bighorn sheep, snow willow and alpine conservation, boreal toad, and unique and rare plant communities.

The Forest maintains an early detection program for white-nose syndrome in bats, follows guidance from the Forest Service Rocky Mountain Regional Office, and continues to coordinate with partners and other agencies to protect bats from white-nose syndrome.

Bat habitat needs are addressed through the Abandoned Mine Lands program. The Forest maintains existing partnerships and seeks additional partners for adequate underground assessments, as possible, prior to closure. When closing caves and mines, access for bats is retained and disturbance to resident bat populations is minimized. When maintaining or removing facilities or bridges, the potential for bat roost activity is assessed. Work is scheduled to reduce impacts to roosting bats.

When raptors are known to occur in a project area, the Forest consults raptor guidance provided by Colorado Parks and Wildlife.

During project analysis address impacts to pollinators during project analysis through project design, analysis, and implementation.

Pollinator-friendly best management practices for Federal lands are implemented to improve pollinator habitat and protect these species when implementing management actions. Actions are not limited to the following:

- Design projects to maintain or improve pollinator habitat while meeting resource objectives,
- Include plants that are desirable to pollinator species in project seed mixtures,
- Mitigate impacts to pollinator insects when applying insecticide,
- Include creation and maintenance of pollinator habitat in project design, and
- Implement best management practices for pollinator habitat when managing roads.

The Forest provides a focus on bird conservation by increasing the number of Naturewatch viewing sites and by participating in International Migratory Bird Day activities. Management activities consider habitats and species described in the Colorado Bird Conservation Plan.

The Forest considers the impacts of actions on unique or rare plant community types, particularly those with a biodiversity significance ranking of B1 (outstanding) or B2 (very high) according to the Colorado Natural Heritage Program. In riparian areas and wetland ecosystems containing plants with G1, G2, S1, or S2 NatureServe plant community conservation ranks, impacts are considered with a focus on maintaining ecological integrity.

Existing landscape patterns and local species concerns are used to identify and assess habitat connectivity at various spatial scales during design and analysis of forest management activities. A nest of hydrologic unit codes is used at various scales to assess connectivity patterns. Stream zones and topographic features are identified and used to facilitate movement across the landscape. These areas serve multiple purposes, including providing aquatic and terrestrial habitat connectivity and areas for species movement in most landscape conditions.



Figure 8. Great horned owl

Desired Conditions

DC-WLDF-1: Habitat conditions are suitable for resident and migratory birds and accommodate key life history requirements. (Forestwide)

DC-WLDF-2: Habitat conditions for bats are suitable for reproduction and roosting. (Forestwide)

DC-WLDF-3: Habitat connectivity is provided to facilitate species movement within and between daily home ranges, for seasonal movements, for genetic interchange, and for long-distance movements across boundaries. (Forestwide)

DC-WLDF-4: Winter range habitat conditions provide the quantity, quality, and spatial arrangement of forage, cover, and security needed to support population objectives for mule deer, pronghorn, Rocky Mountain bighorn sheep, and Rocky Mountain elk. (Forestwide)

DC-WLDF-5: Motorized and nonmotorized route travel, on and off existing roads, does not negatively affect ecological conditions necessary to maintain population objectives for big game species. (Forestwide)

DC-WLDF-6: Suitable nesting habitat for ground-nesting or low-level shrub-nesting birds is provided by dense, interior riparian willow habitat. (Forestwide)

Objectives

OBJ-WLDF-1: Develop and interpret at least one location identified in the Colorado Birding Trail over the next 15 years. (Forestwide)

OBJ-WLDF-2: Maintain or improve an average of 500 acres of big game winter habitat annually over the next 15 years. (Forestwide)

Standards

S-WLDF-1: Do not allow rock climbing within one-half mile of active peregrine and prairie falcon nest sites generally from April 15 to July 31 and active golden eagle nest sites generally from December 15 to July 31. (Forestwide)

Guidelines

G-WLDF-1: To reduce stress at a critical point in the lifecycle of big game, restrict activities on winter range from approximately December 1 to March 31, as needed. (Forestwide)

Goal 2

Protect and restore watershed health, water resources, aquatic ecosystems, and the systems that rely on them

Fisheries (FISH)

Management direction is provided for individual resource areas. This direction has been integrated across resource areas. Plan components contained in this section cover the broad area of aquatic habitats that are present throughout the Forest and support all fisheries. Species of conservation concern (Rio Grande cutthroat trout, Rio Grande chub, and Rio Grande sucker), all other native species, and desired nonnative recreational species are included.

Aquatic species include vertebrate and invertebrate animals that live in the water for most or all of their life cycle. Fisheries management focuses on fish species and the habitat components that are vital to their survival. Persistence of these species over time is dependent on an array of well-connected habitat conditions. Management activities can contribute to fragmentation and degradation of habitat for fish and other riparian-dependent species. Dam construction, introduction of nonnative invasive species, livestock grazing, road and facility construction, and vegetation management activities can change habitat conditions.

Many of the plan components that affect fisheries are also addressed in other sections including, but not limited to, *Minerals, Aquatic and Terrestrial Nonnative Invasive Species and Noxious Weeds, Recreation, Riparian Management Zones, Soils, Watersheds, Wildlife, and Species of Conservation Concern*. Specific direction for designated wilderness and designated and eligible wild, scenic, and recreational rivers is also provided.

Management Approaches

Principal strategies and program priorities to protect fish and aquatic resources

Annually, the Forest works with signatories of the Conservation Agreements for Rio Grande Cutthroat Trout (RGCTCT 2013) and the Rio Grande Chub and Rio Grande Sucker (RGCSCT 2018). Shared data are used to maintain and update species occurrences, and the fisheries activity

period maps that are contained on the external drive of maps located in the back of the document facilitate consistent and effective implementation of the agreements for use during project-level analysis and in guidance specific to recreational dredging.

The Forest coordinates with staff from Colorado Parks and Wildlife on fish stocking programs. This ensures benefits and reduces degrading effects on native and desired nonnative fish and aquatic species. Recreational fish stocking reports are provided to Colorado Parks and Wildlife by June 15, or as they become available.

Desired Conditions

DC-FISH-1: Connectivity of habitat for native and desired nonnative fish and aquatic species is maintained or enhanced by the design and implementation of management actions. Populations are expanding into previously occupied habitat, and interconnectivity is maintained within metapopulations. To maintain sustainable populations, critical life stages are distributed and abundant. Habitat conditions are not a primary factor in species being proposed or listed under the Endangered Species Act or for adding species as a species of conservation concern.

DC-FISH-2: Habitat and water quality in lakes and streams allow fish populations to thrive, and habitat is not fragmented by management activities.

Objectives

OBJ-FISH-1: Complete 10 fish connectivity projects (combination of removing barriers or constructing aquatic organism passage structures) over the next 15 years.

OBJ-FISH-2: Maintain or restore structure, composition, or function of habitat for fisheries and other aquatic species along 30 miles of stream, with a focus on larger individual stream segments when possible over the next 15 years. (Forestwide)

Standards

S-FISH-1: When authorizing new surface diversions in fish-bearing waters, provide upstream and downstream passage designed for all fish species that are threatened, endangered, proposed or candidate species, and for species of conservation concern except when barriers are needed to protect from undesired nonnative fish. (Forestwide)



Figure 9. A pond above Pole Creek

Guidelines

G-FISH-1: New surface diversions should provide passage for native and desired nonnative aquatic species to maintain connectivity except when barriers are needed to protect from undesired nonnative fish. (Forestwide)

G-FISH-2: Newly constructed perennial stream crossings and aquatic organism passages allow natural streamflow, and bidirectional movement of adult and juvenile fish and other wildlife. (Forestwide)

G-FISH-3: Fisheries activity period maps (external drive of maps located in the back of the document) should be consulted during project development and design, including recreational dredging. Date ranges associated with stream classes identified on the map are listed in Table 9.

Table 9. Dates and species of fish by class of water body

Water Body Class	Species	Restricted Activity Period
A	Core and conservation Rio Grande cutthroat trout	Dates provided by Fisheries Biologist
B	Recreational Rio Grande cutthroat trout	May 15 to June 30

Water Body Class	Species	Restricted Activity Period
C	Brown and brook trout Rainbow trout	October 1 to December 31 April 1 to August 31
D	No fish or any other species	None

Fisheries activity period maps designate the class of a mapped waterbody (A, B, C, or D). They correspond with the restricted activity period in Table 9 and describe the locations of Class A water bodies, and may specify special conditions. Except for uncoded water bodies, which do not appear on the maps, class is designated on the maps. Uncoded water bodies are Class D unless otherwise specified. When uncoded water bodies enter mapped Class A, B, or C water bodies, the portion of the uncoded water body 1 mile upstream from the mouth is the same class as the mapped water body it enters. This is applied even if the unmapped water body is dry or frozen to the bottom at the time of implementation.

Where unmapped water bodies enter a mapped Class A water body, the unmapped water body is Class A for the portion of the unmapped water body for a distance of 1 mile upstream from the mouth of the unmapped water body, including where the unmapped water body is dry or frozen to the bottom at the time of the project, and Class B for any other portion of the unmapped water body. Where an unmapped water body enters a mapped Class B water body, the unmapped water body is Class B for the portion of the unmapped water body for a distance of 1 mile upstream from the mouth of the unmapped water body, including where the unmapped water body is dry or frozen to the bottom at the time of the project, and Class C for any other portion of the unmapped water body. Where an unmapped water body enters a mapped Class C or D water body, the unmapped water body is Class C or D for all portions of the unmapped water body, respectively. Where an unmapped water body enters a fish-bearing lake, the unmapped water body is Class C, whether or not the fish-bearing lake appears on the activity period map(s).

Groundwater-Dependent Ecosystems (GDE)

Groundwater-dependent ecosystems are a vital component for the natural environment and can include fens, wetlands, seeps, springs, riparian areas, groundwater-fed streams and lakes, and aquifers. These are present throughout the Forest and vary in size and timing. These areas provide an important ecosystem component and provide later-season flows with cold water temperatures, help sustain the function of surface and subsurface aquatic ecosystems, and provide habitat important to the persistence of plant species of conservation concern.

Areas that retain moisture and associated vegetation types have long been recognized as important for both ecosystem function and human benefits. Riparian areas and groundwater-dependent ecosystems such as wetlands, springs, aquifers, and fens provide ecosystem services that are necessary for the long-term health and well-being of both aquatic and upland areas. Services provided by these areas are vital to the water supplies of downstream users. Services include stabilizing streambanks and reducing erosion, mitigating the impacts of floods, improving water quality by trapping sediment and other pollutants, and sustaining late season base flows. These areas are also vital to a wide variety of plants and animals. Aquatic and terrestrial species depend on the forage and cover provided in these habitat types, and many rare plants occur only in these ecosystems.

Management Approaches

Principal strategies and program priorities to protect groundwater-dependent resources

Fens and watershed conditions that support healthy fens provide irreplaceable ecological functions. The Forest continues to inventory and evaluate fens, thereby enabling managers to maintain healthy watersheds and aquatic resources.

The Forest continues to work with other agencies and adjacent landowners in the conservation of groundwater-dependent ecosystems.

Desired Conditions

DC-GDE-1: Identified groundwater-dependent ecosystems provide habitat for species of conservation concern and other native species. Fens continue to accumulate peat. (Forestwide)

Standards

S-GDE-1: Do not authorize management actions that alter the hydrology of groundwater-dependent habitat features. (Forestwide)

Guidelines

G-GDE-1: To maintain ecosystem diversity and function, design projects to avoid or mitigate negative impacts to the ecological services that groundwater-dependent ecosystems provide. (Forestwide)

Riparian Management Zones (RMZ)

Naiman et al. (2000) identifies that discoveries about the structure and dynamics of riparian zones have important implications for stream and watershed management. Forest plans must establish width(s) for riparian management zones around all lakes, perennial and intermittent streams, and open-water wetlands (USDA Forest Service 2015). The following guidance has been developed to help interdisciplinary teams become familiar with, and consistently apply, criteria to appropriately delineate riparian management zones, and analyze important considerations in developing appropriate management actions within, or that affect, riparian management zones. The intent is to ensure that interdisciplinary teams adequately consider riparian functions and ecological processes in both the delineation of riparian management zones and the determination of appropriate management actions within, or that affect, riparian management zones.

Riparian areas represent the area where aquatic and terrestrial ecosystems interface. These important areas occur along streams, rivers, lakes, wetlands, and other waterbodies. These areas can be restored using passive and active management.

Delineation and further definition of riparian management zones are contained in Appendix F.

Desired Conditions

DC-RMZ-1: Riparian areas and wetlands are healthy, fully functioning ecosystems that are resilient and able to withstand natural and human disturbances that include flood, fire, drought, changes in frequency and timing of weather events, recreation, and herbivory. Aquatic ecosystems, riparian ecosystems, and watersheds exhibit high ecological integrity. The

vegetation consists of desirable native species and age classes and meets the needs of resident amphibians, fish, and migratory birds. Populations of riparian vegetation are diverse, vigorous, and self-perpetuating. Invasive species, including plants and animals, in riparian and wetland ecosystems are rare. There is sufficient vegetative cover to provide bank stability, trap and retain sediment, regulate temperature, and contribute to floodplain function. Riparian ecosystem composition, structure, and function can generally be restored and enhanced by beaver habitat. (Forestwide)

DC-RMZ-2: Hydrologic regimes of riparian and wetland ecosystems contribute to appropriate channel and floodplain development, maintenance, and function. (Forestwide)

Objectives

OBJ-RMZ-1: Restore at least 300 acres of riparian or wetland areas over the next 15 years. (Forestwide)

Standards

S-RMZ-1: Management activities may have short-term impacts (generally less than 5 years) to composition, function, and structure of riparian areas and fish habitat. Over the long term (generally greater than 20 years), projects shall not impair connectivity, composition, function, and structure. (Forestwide)

Guidelines

G-RMZ-1: To maintain ecological integrity and connectivity, new system roads and infrastructure should not be constructed in the riparian management zone. (Forestwide)

G-RMZ-2: To provide for the structural nesting habitat requirements for riparian-associated birds, design management activities to avoid healthy willow carrs. (Forestwide)

Watershed (WA)

Healthy, properly functioning watersheds are essential to forest health, water quality, water quantity, and a host of other functions and services. Watershed specific direction contains both national and regional guidance as required by the 2012 Planning Rule (36 CFR 2190). Additional higher level guidance is incorporated and followed to protect watersheds and their associated functions and services.

Watersheds occur at multiple scales and range from the largest river basins that cover thousands of acres, such as the Rio Grande, to small streams with only a few acres of contributing area. Watersheds that are functioning properly have terrestrial, riparian, and aquatic ecosystems that capture, store, and release water, sediment, wood, and nutrients within their range of natural variability for these processes.

Many attributes define the condition, or health, of a watershed. These include, but are not limited to, physical and biologic characteristics such as the timing and quantity of water flows, water quality, the amount of erosion and sedimentation, the stability of streambanks, stream channel dimensions such as width and depth, the condition of riparian vegetation, and the presence of native or desired nonnative aquatic species. The attributes that reflect the state of a watershed condition are continually changing because of natural disturbances (e.g., disease, floods, insect

landslides, and wildfire), natural variability of ecological processes (e.g., flows and cycles of energy, nutrients, and water), climate variability, and human modifications.

The watershed condition policy goal of the Forest Service is “to protect National Forest System watersheds by implementing practices designed to maintain or improve watershed condition, which is the foundation for sustaining ecosystems and the production of renewable natural resources, values, and benefits” (FSM 2520). The forest plan components listed below are designed to assist land managers in maintaining or improving watershed condition by focusing on the key physical and biological attributes and processes of watershed condition that will allow watersheds to be resilient in the face of both natural and human disturbances.

Desired Conditions

DC-WA-1: Physical channel characteristics are in dynamic equilibrium and are commensurate with the natural ranges of discharge and sediment load provided to a stream. Streams have the most probable form and the expected native riparian vegetation composition within the valley landforms that they occupy; they function correctly without management intervention. Historically disturbed and degraded stream channels recover through floodplain development and establishment of riparian vegetation, and demonstrate stable channel geomorphic characteristics. Beaver reintroduction, and the persistence of beaver habitat, can contribute to channel recovery and floodplain function. Upland areas function properly and do not contribute to stream-channel degradation. Roads, trails, and impervious surfaces minimally affect hydrologic processes within watersheds. The sediment regime within water bodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport. (Forestwide)

DC-WA-2: Within the constraints of existing water rights decrees, the timing and magnitude of flood events is within the natural range of variation. Floodplains are accessible to water flow and sediment deposits. Overbank floods allow floodplain development and support healthy riparian and aquatic habitats. Floods also allow the propagation of flood-associated riparian plant and animal species. (Forestwide)

DC-WA-3: State water quality standards are met and State-classified water uses are supported for all federal water bodies. Water quality for those water bodies listed as impaired on the State of Colorado 303(d) list move toward fully supporting State-classified uses. (Forestwide)

DC-WA-4: Aquifers maintain natural conditions of recharge, discharge, and groundwater quality, especially where they are important to surface features dependent on groundwater for their existence (including but not limited to caves, springs, seeps, lakes, riparian areas, wetland ecosystems, fens, and intermittent and perennial streams). (Forestwide)

DC-WA-5: Watersheds provide clean, safe water suitable for public consumption after adequate and appropriate water treatment. (Forestwide)

Objectives

OBJ-WA-1: Improve condition class on at least one identified priority watershed, as defined by the national Watershed Condition Framework within 5 years of the date on the forest plan decision. (Forestwide)

OBJ-WA-2: Quantify minimum instream flows at new quantification points for stream reaches impacted by federal land acquisitions over the next 5 years. (Forestwide)

Standards

S-WA-1: Incorporate direction included in the National Core Best Management Practices (FS 990A) and Watershed Conservation Practices Handbook (FSH 2509.25), to develop project-specific best management practice prescriptions in project plans. (Forestwide)

Guidelines

G-WA-1: Maintain or restore water quality by assuring that activities meet State of Colorado water quality standards. Management activities in watersheds where State of Colorado 303(d) listed impaired water bodies exist should assist in achieving State water quality standards. (Forestwide)

G-WA-2: Management actions should not cause long-term degradation to water resources, including lakes, streams, wetlands, and groundwater. Particular attention should be paid to public water supplies, sole source aquifers, and source water protection areas. (Forestwide)

Goal 3

Actively contribute to social and economic sustainability in the broader landscape and connect citizens to the land

Air Quality (AIR)

The Clean Air Act and subsequent amendments require Federal land managers to protect air quality related values in Class 1 areas and to protect human health and basic resource values in all areas. The La Garita, Weminuche, and nearby Great Sand Dunes Wilderness areas are classified as Class 1 areas where very little deterioration of air quality is allowed. Virtually all land management activities on the Forest occur outside the non-attainment boundaries. The greatest potential to affect air quality would be from smoke (wildfires, prescribed fires) and road dust.

Desired Conditions

DC-AIR-1: Air quality related values over Class 1 and Class II wilderness areas meet or exceed state standards. (Forestwide)

Guidelines

G-AIR-1: To protect water quality, oils and solvents should not be used for dust abatement measures. (Forestwide)

Areas of Tribal Importance (ATI)

The San Luis Valley and the surrounding mountains are the ancestral homelands of several American Indian clans, bands, and tribes. Despite their removal by the U.S. Government in the late 1800s, several tribes maintain strong cultural and spiritual connections to the area. These include the Jicarilla Apache, Navajo, Southern Ute, and Ute Mountain Ute Tribes, as well as several Upper Rio Grande and Western Pueblos. Ceremonial and culturally important sites and

traditional gathering areas exist on the Forest. Tribes affiliated with the area exhibit a continuing interest in the homeland-related traditions of their people and look to the Forest to aid in the maintenance and re-establishment of cultural connections to ancestral landscapes.

Policy development and methods of consulting with tribes has evolved since the last forest plan was completed 20 years ago. Though not repeated here, the legal framework of Federal policy, case law, and Executive orders provides guidance and establishes standards for tribal authorities and uses of national forests as well as creates pathways to greater collaboration and connection between the Forest and the tribes at all management levels of the Forest Service.

Management Approaches

Principal strategies and program priorities to protect areas of tribal importance and spiritual connections to the area

The Forest develops interpretive and educational exhibits and other media focusing on the history of forest lands in collaboration with tribes. This provides a greater understanding and appreciation of shared history, culture, and traditions.

The Forest maintains meaningful relationships with tribes that are built on trust and works with tribes in developing interpretive and educational materials to aid in protecting areas of tribal importance.

The Forest partners with interested tribes in determining the eligibility of Mount Blanca as a traditional cultural property for the National Register of Historic Places.

The Forest develops a management plan to assist in maintaining cultural values, involving staff from the Bureau of Land Management San Luis Valley Field Office, Pike-San Isabel National Forest, interested tribes, U.S. Fish and Wildlife Service Sangre de Cristo Conservation Area, and other non-Federal partners.

The Forest accommodates and facilitates traditional use of areas acknowledged as traditional cultural properties and other culturally important places that are essential to maintaining the continuing cultural identity of associated communities.

In coordination with tribes, the Forest develops collaborative proposals and partnerships to implement projects of mutual benefit and economic development, or both, using federally authorized or advocated programs where available.

The Forest consults with tribes at initial planning stages and during project design. As appropriate, tribal perspectives, needs, and concerns, as well as traditional knowledge, are incorporated into project design and decisions, such as areas acknowledged as traditional cultural properties.

Confidential and sensitive information, or both, regarding sacred sites is held in the strictest confidence.

Desired Conditions

DC-ATI-1: Acknowledged traditional cultural properties are present for their cultural importance and are generally free of impacts from other uses. (Forestwide)

DC-ATI-2: Access for tribal members is provided for the exercise of treaty rights and to allow opportunities to practice traditional, cultural, educational, and religious activities. (Forestwide)

DC-ATI-3: Traditionally used resources are managed sustainably and are available for future generations. (Forestwide)

Guidelines

G-ATI-1: To protect areas of tribal importance, such as areas acknowledged as traditional cultural properties, minimize restoration and recreation activities and uses, as well as the development of new facilities and infrastructure, near these areas. (Forestwide)

G-ATI-2: Purposeful excavation, photography, and destructive analysis of human remains, or any one of these, for educational purposes will be considered only by consulting tribes.

Congressionally Designated Trails (CDT)

Direction included in this section applies to the management of two congressionally designated trails on the Forest: the Continental Divide National Scenic Trail and the Old Spanish National Historic Trail, which were designated by Congress in 1978 and 2002, respectively.

The National Trails System Act of 1968 authorized creation of a national trail system consisting of national scenic, historic, and recreation trails. National scenic and national historic trails may be designated only by an act of Congress. Both congressionally designated trails that traverse the Forest are managed with a one-half-mile-wide buffer on either side of the trail, and this buffer is shown on maps.

Continental Divide National Scenic Trail

The 3,100-mile-long Continental Divide National Scenic Trail follows the backbone of the Rocky Mountains from Canada to Mexico. The trail traverses portions of 20 national forests, 4 national parks, and 13 Bureau of Land Management districts, as well as various private lands in Colorado, Idaho, Montana, New Mexico, and Wyoming. About 170 miles of the trail is routed through the Rio Grande National Forest, from its northern boundary with the Gunnison National Forest, to the New Mexico state line.

The Forest Service is the lead agency responsible for management of the Continental Divide National Scenic Trail. Management of the trail is consistent with the nature and purposes of the trail as described in the 2009 Continental Divide National Scenic Trail Comprehensive Plan, and any revisions.

Management Approach

Principal strategies and program priorities to manage the Continental Divide National Scenic Trail

The Forest encourages trail partners and volunteers to assist in the planning, development, maintenance, and management of the trail, consistent with the Continental Divide National Scenic Trail Comprehensive Plan.

The Forest evaluates proposed relocations or new segment locations using defined optimal location criteria.

Opportunities to acquire lands or rights-of-way in or adjacent to the Continental Divide National Scenic Trail corridor will be identified and pursued as feasible.

Consistent signage is provided along the Continental Divide National Scenic Trail at road and trail crossings to identify the trail. Interpretive signs are provided at key entry points and at historic and cultural sites to orient visitors and enhance their experience.

During emergencies, incident management teams are made aware of the Continental Divide National Scenic Trail as a resource to be protected. Fire suppression rehabilitation and long- term recovery of the Continental Divide National Scenic Trail corridor are identified as high priorities for incident management teams, burned area emergency recovery teams, and post- fire rehabilitation interdisciplinary teams.



Figure 10. The Continental Divide National Scenic Trail at Stony Pass

Over time, appropriate carrying capacities will be established for specific segments of the Continental Divide National Scenic Trail by monitoring use and conditions. Appropriate management actions are taken to maintain or restore the nature and purposes of the trail if the results of monitoring or other information indicate a trend away from the desired conditions.

To provide for user safety and health, adequate trail facilities are provided that accommodate the amount and types of use anticipated on any given trail segment. Minimal facilities are provided to preserve or promote a setting that appears natural.

Old Spanish National Historic Trail

The Old Spanish National Historic Trail was designated in 2002. Pioneered by Antonio Armijo in 1829, the Old Spanish Trail was a trade network with several routes that carried woolens and slaves between Santa Fe and Los Angeles in trade for horses in Mexico's California territory. The congressionally designated East Fork of the North Branch of the Old Spanish National Historic

Trail runs through the Forest, generally following the west flanks of the Sangre de Cristo Mountains before winding up Saguache Creek and into the Gunnison Basin. Inventory and research have identified the Bunker Site as an archaeological site along the trail within the Forest.

The Old Spanish National Historic Trail Comprehensive Administrative Strategy (December 2017) guides management of the trail across six states and a variety of ownerships. Trail management and activities will be coordinated across and adjacent to unit and jurisdictional boundaries.

Management Approach

Principal strategies and program priorities to manage the Old Spanish National Historic Trail

The Forest develops appropriate measures to protect high potential sites and segments from deterioration due to natural forces, visitor use, vandalism, and other impacts.

The Forest coordinates with trail administrators, recreation staff, volunteers, and trail organizers to plan for, develop, maintain, and manage high potential segments, sites, and segments under study for the Old Spanish National Historic Trail.

Prominent access points along the Old Spanish National Historic Trail are signed to enhance user experience and safety.

Federally recognized tribes, appropriate Federal, State, and local agencies, and trail administrators are consulted regarding planning and development activities for the Old Spanish National Historic Trail.

Desired Conditions

DC-CDT-1: Viewsheds from the Continental Divide National Scenic Trail have high scenic values. The foreground of the trail appears natural. (Forestwide)

DC-CDT-2: The Continental Divide National Scenic Trail is a well-defined trail that provides for high-quality primitive hiking and horseback riding opportunities, and other compatible nonmotorized trail activities, in a highly scenic setting along the Continental Divide. The significant scenic, natural, historic, and cultural resources along the trail corridor are conserved. Where possible, the trail provides visitors with expansive views of the natural landscapes along the Continental Divide. (Forestwide)

DC-CDT-3: The Continental Divide National Scenic Trail can be accessed from multiple locations, allowing visitors to select the type of terrain, scenery, and trail length (e.g., ranging from long distance to day use) that best accommodates their desired outdoor recreation experience(s). Wild and remote backcountry segments provide opportunities for solitude, immersion in natural landscapes, and primitive outdoor recreation. Easily accessible trail segments complement local community interests and needs and help contribute to a sense of place. (Forestwide)

DC-CDT-4: The Continental Divide National Scenic Trail is well maintained, signed, and passable. Alternative routes are made available in the case of temporary closures resulting from natural events, such as fire or flood, or land management activities. (Forestwide)

DC-CDT-5: The landscape of the North Branch of the Old Spanish National Historic Trail is managed to maintain its nature and purpose while providing educational opportunities, promoting stewardship, providing opportunities for heritage tourism, and protecting traditional cultural properties. (Forestwide)

Objectives

OBJ-CDT-1: Restore or relocate one segment of the Continental Divide National Scenic Trail to improve scenic viewing opportunities and/or to provide for a nonmotorized experience over the next 15 years. (Forestwide)

Standards

S-CDT-1: Do not authorize development of oil and gas, geothermal energy, or other leasable mineral resources within the Continental Divide National Scenic and the Old Spanish National Historic Trail corridor. (Forestwide)

S-CDT-2: Do not authorize common variety mineral extraction (e.g., limestone, gravel, pumice, etc.) within the congressionally designated trail corridors. (Forestwide)

Guidelines

G-CDT-1: Forest health projects that result in short-term impacts the scenic integrity of the Continental Divide National Scenic Trail should apply mitigation measures, including but not limited to screening. (Forestwide)

G-CDT-2: To provide for a naturally appearing setting while avoiding impacts from motorized use, no new temporary or permanent roads, or motorized trails, should be constructed across or adjacent to the Continental Divide National Scenic Trail, unless needed for resource protection, private land access, or protection of public health and safety. (Forestwide)

Suitability

SUIT-CDT-1: The Continental Divide National Scenic Trail and corridor is not suitable for oil and gas or geothermal energy development or other leasable mineral activity.

SUIT-CDT-2: The Continental Divide National Scenic Trail and corridor is not suitable for common variety mineral extraction, including but not limited to limestone, gravel, and pumice.

Cultural Resources (CR)

The Forest contains cultural resources that demonstrate human occupation and use for at least the last 12,000 years. American Indian, Hispanic, and Euro-American communities continue to use the Forest for economic, social, recreational, and religious purposes. These include long-term, rural, land-based communities that use the Forest for subsistence purposes. An understanding of cultural resources and historic uses is important to understanding shared heritage and the social, economic, and ecological sustainability of the planning area, the State of Colorado, the Rocky Mountain region, and the Nation as a whole.

Currently, about 2,099 cultural resources have been documented, including prehistoric and historic remains. About 18 percent of the Forest has been inventoried for cultural resources to some degree. Resources within the Forest represent processes and events important to the identity and history of both tribal groups and long-term, land-based communities. Cultural

resources can contain a wealth of information for potential scientific research regarding social and ecological conditions and changes through time, including human successes and failures in coping with these transformations over the past 12,000 years. This information is valuable to managers making decisions regarding contemporary and future ecological management and for educating the public about the complex ecological sustainability of the Forest.

Management Approaches

Principal strategies and program priorities to manage cultural resources

Sites are protected from activities including, but not limited to, vegetation treatment and prescribed fire. Protection can require attention to avoid "islanding" of sites, which can occur from simply avoiding areas to reduce impacts from erosion, severe fire effects, and livestock grazing.

The Forest develops and maintains partnerships to assist in meeting targets, maintaining facilities and infrastructure, completing monitoring, developing resource specific plans, mapping habitat and use, and more. Partnerships are encouraged with traditional communities, surrounding communities and governments, nonprofit groups, volunteers, professional organizations, schools, and any other interested individuals and groups.

In compliance with Section 110 of the National Historic Preservation Act, the Forest completes a non-project inventory annually. The following prioritization is applied:

- Areas where eligible cultural resources are threatened or ongoing impacts are unknown and need to be assessed.
- Areas indicated to have high cultural value or high density of cultural resources.
- Areas of importance to traditional communities.
- Areas where additional survey will contribute to a greater regional understanding of a specific management unit or special interest area.

The Forest develops and maintains collaborative partnerships and volunteer efforts to assist the agency in researching and managing cultural resources. Partnerships focus on traditional communities, nonprofits, volunteers, professional organizations, and schools.

The Forest develops management and preservation plans for administrative facilities and infrastructure that are significant cultural resources with special significance, or are sites that receive frequent visitor use.

Areas that are acknowledged as traditional cultural properties or cultural landscapes, and other culturally significant areas identified by local communities, provide tangible links to historically rooted beliefs, customs, and practices. These resources are protected through consultation, traditional cultural practices, consulting parties, and project design.

Cultural resources are integrated into all resource management decisions and align with the affirmative management, including protection, of significant cultural resources.

The Forest develops a database of fire-sensitive sites, structures, and other resources to facilitate resource protection during fire management.

The Forest provides opportunities for responsible officials and employees in the agency to receive training to gain a broader understanding of the unique legal relationship between the

Federal Government and Indian tribes, and to learn about American Indian law, customs, traditions, and values.

The Forest continues to identify and map populations of *Ligusticum porteri*. Following mapping, the Forest will consider setting aside collection areas for tribal use and rotating the use of these areas over time. Consultation will assist in identifying other plants that are important to tribes. See also *Vegetation Management* section.

The Forest continues to work with tribes to understand community needs and build respectful, collaborative relationships to achieve mutually desired conditions.

Operation and maintenance plans for special use permits, including recreation residences eligible for inclusion on the National Register of Historic Places, include stipulations to ensure preservation of the historic characteristics of the site.

Desired Conditions

DC-CR-1: Interpretation and management of cultural resources connects the public to the past, to the land and its history. The Forest strives to identify, preserve, and protect cultural resources that have scientific, cultural, or social values, including areas acknowledged as traditional cultural properties and historic agency administrative buildings. Cultural and natural resources and historic uses that help sustain cultural communities and contribute to social and economic sustainability are preserved and maintained. Long-standing, land-based rural communities that have depended on the Forest are recognized and valued. Cultural resources are protected from natural forces, excessive visitor use, vandalism, and other impacts.

Standards

S-CR-1: Include applicable provisions in contracts, agreements, and special use permits as needed to protect cultural resources. (Forestwide)

Guidelines

G-CR-1: Preserve cultural artifacts in place, or curate when necessary. (Forestwide)

Infrastructure (INFR)

Access is necessary to provide a variety of uses and experiences. Structures are also necessary for the operation and management of the Forest as well as for public safety. The developed infrastructure within the Forest includes bridges, roads, trails, utility corridors, dams, and buildings for administrative, recreational, or special use purposes. An existing road system provides access to the recreating public as well as purchasers of forest products, owners of private land, contractors, and researchers, among others. Utility corridors (transmission lines) provide power and telecommunications access, as well as public safety. Maintained facilities include rental cabins, developed recreation sites, historic sites, and administrative sites.

Management Approaches

Principal strategies and program priorities to manage infrastructure

Manage the Forest transportation system to reduce resource damage and address public safety.

Facilities acquired through land donation, exchange, or purchase are not retained unless they serve a definitive purpose and funding is available for maintenance, or they are historically significant.

Facilities are managed in compliance with the facilities master plan.

Closed or restricted use roads are available for administrative purposes upon approval by the responsible official. These roads are not displayed on the Forest motor vehicle use map.

Designated roads, as displayed on the Forest motor vehicle use map, and newly constructed roads, are open to motorized vehicle use unless a document decision shows that:

- Motorized use conflicts with forest plan objectives,
- Motorized use is incompatible with the recreation opportunity spectrum class,
- Roads and trails will not be managed as open to public motorized use,
- Motorized use creates use conflicts that result in unsafe conditions unrelated to weather conditions,
- Physical characteristics of roads and trails are hazardous for motorized use,
- Roads and trails do not serve an existing or identified public need, or
- Financing is not available for maintenance necessary to protect resources.

Motorized use is restricted on all areas not designated for motorized use on the Forest motor vehicle use map. Forest orders may also be used to close areas for various reasons. Over-the-snow motorized vehicle use is allowed unless specifically restricted.

The impact of potential alterations in timing, magnitude, and duration of seasonal runoff is considered on infrastructure design and construction. Considerations include evaluations of climate change vulnerability assessment for infrastructure, including recreational infrastructure.

Road use is managed with seasonal closures if:

- Use is causing unacceptable damage to soil and water resources due to weather or seasonal conditions,
- Use is causing unacceptable wildlife conflicts or habitat degradation,
- Use is resulting in unsafe conditions due to weather conditions,
- The road(s) serve a seasonal public or administrative need, or
- The area accessed has a seasonal need for protection.

New trails are developed to expand recreation opportunities, ensure user safety, and disperse existing use. Trail construction is consistent with other resource objectives.

The travel management process is followed during project-level design and analysis to move toward a sustainable Forest road system.

Desired Conditions

DC-INFR-1: The transportation system is commensurate with resource management needs, public safety, emergency access, and public access to use and enjoy the Forest. Road restrictions

occur for resource management activities that protect, maintain, and enhance habitat, soil, and water objectives, among other values. (Forestwide)

Guidelines

G-INFR-1: To blend with natural surroundings, construct or restore structures to blend with the natural surroundings wherever feasible and practicable. (Forestwide)

Lands (LAND)

The three primary functions of the Forest lands program are land survey and boundary management, land adjustments, and special uses, for both recreation and non-recreation. Boundary management ensures that the Forest secures and protects the rights, title, values, and interests of the American public on National Forest System lands. This includes the management of boundary lines within the Forest that border state, private, and other Federal agency lands, as well as secured rights-of-way for access to the Forest.

Management Approaches

Principal strategies and program priorities to manage the Forest lands program

Land adjustments consolidate and improve management efficiency through real estate transactions including sales, purchases, exchanges, conveyances, and rights-of-way within and outside the proclaimed Forest boundary. Lands can be transferred to the Forest Service through purchase, exchange, or gifting to the agency. Regardless of the transfer method, the Forest Service can only acquire land from willing parties that meet the criteria. The types of land the agency prefers to acquire include:

- Lands within congressionally designated areas,
- Lands with water frontage, wetlands, and associated riparian ecosystems,
- Lands with habitat for endangered or threatened species,
- Lands with unique historical or cultural resources,
- Lands primarily of value for outdoor recreation purposes and lands needed for aesthetic protection,
- Key tracts that promote effective resource management,
- Lands that consolidate ownership and reduce miles of property lines and corners to be maintained, and
- Lands that maintain or stabilize economies of local governments.

Manage special uses in a manner that protects natural resources, public health, and safety, and is consistent with management plans for National Forest System lands. Special uses are administered on the basis of sound resource management objectives and business principles.

Existing and designated rights-of-way in the 1996 Land and Resource Management Plan are managed to maintain them for future construction and occupancy.

Communication sites and utility lines are fully developed prior to authorization of new sites. New sites may be necessary to fill coverage gaps or meet public needs.

Management activities in linear corridors should be consistent with direction for the management area the corridor passes through.

Land ownership patterns support land and resource goals and objectives, reduce future management costs, respond to community needs, protect critical resource areas, increase recreation opportunities, and improve legal access.

The authorization and administration of special uses by individuals, companies, groups, and government entities protect natural resource values and public health and safety.

Standards

S-LAND-1: Bury electrical utility lines of 33 kilovolts or less, and telephone lines, unless scenic integrity objectives of the area can be met using an overhead line or burial is not technically feasible. (Forestwide)

S-LAND-2: Do not authorize conflicting uses of activities in transportation and utility corridors. (Forestwide)

Minerals (MIN)

National Forest System lands are important storehouses of domestic minerals and energy resources. The search for and production of minerals and energy resources are authorized uses of National Forest System lands, except those lands formally withdrawn from mineral activities by acts of Congress or by executive authority. Mineral activities on National Forest System lands are facilitated in compliance with the national Mining and Mineral Policy Act and are consistent with the agency mission.

Management Approaches

Principal strategies and program priorities to manage the minerals program

The Forest administers minerals activities through a plan of operations, which includes permits as well as the reclamation and mitigation measures necessary to protect resources.

The Abandoned Mine Lands Program addresses past mines that are no longer active. These lands can pose a hazard to the public, wildlife, and the environment. The program evaluates abandoned mines across the unit and the impacts of these. Mine closure decisions consider and assess needs related to other resources as well, such as wildlife. The program uses partners to evaluate and complete the process.

Procedures assure protection of water quality and fish habitat. The list below addresses management of recreational dredging that occurs on the Forest.

1. Limit use of the practice to outside of critical life-stage periods in streams that have Rio Grande cutthroat trout core conservation populations.
2. The Forest geologist (or designated authority) will review the notice of intent prior to the commencement of activities.
3. Where possible, retain existing instream and riparian vegetation and other features including but not limited to trees, bushes, shrubs, weeds, or tall grasses along streambanks, natural, large woody debris, and large boulders.

4. Operations should not change the stream channel to direct water flow into a streambank or cause bank erosion or destruction of the natural form or the stream channel.
5. Whenever practical, prevent the release of silt, sediment, sediment-laden water, or any other deleterious substances into the watercourse.
6. Keep equipment and machinery in good operating condition, power washed, and free of leaks, excess oil, and grease.
7. Locate the point of discharge to the creek immediately downstream of the worksite to minimize disturbance to downstream populations and habitats.

Guidelines

G-MIN-1: Mining activities can be acknowledged when the activity does not cause substantial surface disturbance or unacceptable impacts to water quality or fish habitat. Aspects of operation will be contained in the notice of intent. A plan of operations will be required for any activities above the scope of a notice of intent. (Forestwide)

Recreation Management (REC)

Direction below applies to the recreation management program. The natural environment of the Forest offers settings for a wide range of high-quality recreation opportunities, including motorized and nonmotorized opportunities. The Forest provides a variety of summer and winter recreation opportunities that allow visitors to escape from urban environments and enjoy a range of experiences in a variety of rural to primitive settings. Outdoor recreation opportunities include hiking, biking, fishing, hunting, wildlife viewing, driving for pleasure, and the pursuit of spiritual values provided by the natural environment.

Management Approaches

Principal strategies and program priorities to manage recreation

Relationships with partners, cooperators, and permittees are vital to the success of the recreation program, as are building, sustaining, and leveraging strategic relationships to sustain high-quality recreation settings and opportunities.

Recreation development and travel routes are managed to be consistent with the recreation opportunity spectrum class designations.

Available resources (e.g., time, budget, expertise) are strategically invested to support long-term recreation program goals. Developed recreation assets are aligned with projected facility budgets, partnership capabilities, and other re-investment strategies.

Cooperators are encouraged to be involved in stewardship activities.



Figure 11. Backcountry skiers near Wolf Creek Pass

Recreation special use permits are leveraged to accomplish recreation program goals and serve the public.

Readily available off-site and on-site information about Forest recreation opportunities is available at fee campgrounds.

When campground occupancy is less than 20 percent for at least one season, managers determine whether to close the campground, convert it to a dispersed site, or take other action.

Trail development is coordinated with systems developed by municipalities, counties, states, other agencies, and partners to promote integration and connectivity. Loop trails are considered where feasible, particularly at low elevations.

The Forest intends to consider using concessionaire operations when fees are charged at developed sites.

When use exceeds the capacity of an area for a recreation opportunity spectrum class, the following actions will address the impacts or effects on the recreation setting: Provide information to the public and restore the site, regulate use at the site, restrict the number of users, and close the site if necessary.

Desired Conditions

DC-REC-1: A variety of enduring recreation opportunities are available across a variety of settings that foster high-quality, year-round developed and dispersed experiences. Development of facilities and travel routes is consistent with the recreation opportunity spectrum class designations. Recreation facilities and programs incorporate universal design concepts and meet

current Federal accessibility guidelines unless doing so fundamentally alters the setting or character of the program. (Forestwide)

DC-REC-2: Sites and facilities are designed to be long-lasting, require low maintenance, and incorporate “green” operations. The sites and facilities should also complement the natural setting. (Forestwide)

Objectives

OBJ-REC-1: Develop three trail connections between strategic community areas and National Forest System trails within 15 years. (Forestwide)

Standards

S-REC-1: Manage, rehabilitate, or close dispersed recreational use areas when:

- Use area condition reaches Frissell-Cole Class 4 or 5 (compromised natural environment), or
- User conflicts substantially disrupt user experience, safety, or both, and closure is the only alternative (compromised human environment)

S-REC-2: Dispersed camping is limited to 14 continuous days in any one location in any 30-day period. (Forestwide)

Guidelines

G-REC-1: To reduce user conflicts and resource damage, activities and projects should not be approved if they exceed the developed, appropriate threshold for the recreation opportunity spectrum capacity levels listed in Table 10.

Table 10. Recreation opportunity spectrum capacity levels

[Capacity range is defined as follows: **Very Low** and **Low** apply to rock, mountain grass, and clearcuts 1 to 20 years old. **Moderate** applies to mountain grass, mature and pole-sized ponderosa pine, mature aspen, and shelterwood cuts 90 to 120 years old. Selection cut 1 to 20 years old and clearcuts 80 to 120 years old. **High** applies to mature and pole-sized spruce, pole-sized aspen, and clearcuts 20 to 80 years old; **ROS**, recreation opportunity spectrum; **PAOT**, persons at one time; **M acres**, 1,000 acres.]

ROS Class/Capacity Range	Very Low	Low	Moderate	High
Primitive				
Trail (PAOT/mile)	0.5	1	2	3
Area-wide (PAOT/M acres)	1	2	7	25
Semi-primitive Nonmotorized				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	4	8	50	80
Semi-primitive Motorized				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	4	8	10	40
Roaded Natural				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	40	80	1,200	2,500

ROS Class/Capacity Range	Very Low	Low	Moderate	High
Rural				
Trail (PAOT/mile)	2	3	9	11
Area-wide (PAOT/M acres)	500	800	5,000	7,500

Scenery (SCNY)

The Rio Grande National Forest provides a scenic backdrop and contributes to the identities of communities in and around the San Luis Valley. Managing scenic resources ensures quality sightseeing and recreation opportunities. Colorado tourism thrives on outdoor recreation and the beautiful scenery of the Rocky Mountains.

Management Approaches

Principal strategies and program priorities to manage scenery on the Forest

The scenery management system provides a systematic approach for determining the relative value and importance of scenery on the Forest. Scenery management involves identifying scenic components, mapping these components, and assigning a value for aesthetics. Forest plan direction helps incorporate scenery as a part of ecosystems to determine trade-offs at the project level.

Areas with low scenic integrity are rehabilitated to gain compliance with mapped scenic integrity levels.

Forest Service constructs and maintains structures and building features consistent with the principles in the Built Environment Image Guide to complement the scenic character of the natural surroundings.

Management practices are designed to produce forest composition, structure, and patterns similar to those that would have occurred under natural disturbance regimes, where feasible.

Desired Conditions

DC-SCNY-1: Areas of high scenic quality are provided, especially in areas seen from roads and trails, developed recreation sites, administrative sites, and towns and cities near the Forest. (Forestwide)

DC-SCNY-2: Vegetation treatments visually blend with existing scenic character. (Forestwide)

DC-SCNY-3: The transition from Forest lands to adjacent lands with similar desired conditions does not exhibit abrupt changes in scenic quality. (Forestwide)

Standards

S-SCNY-1: Management activities are consistent with identified scenic integrity objectives. Short-term impacts, less than 5 years, that are inconsistent with the scenic integrity objectives may occur. Restoration activities designed to meet or exceed identified scenic integrity objectives should begin within 2 years of project completion. (Forestwide)

Guidelines

G-SCNY-1: Design management activities to minimize impacts to valued scenic attributes and scenic character. Line, form, color, texture, size, shape, edge effect, and patterns of natural vegetation openings complement surrounding scenic character. (Forestwide)

Chapter 3. Management Area Specific Direction

This chapter summarizes the physical, biological, social, and economic environments of the planning area and the effects of implementing each alternative on that environment.

Management Areas (MA)

Forest management provides direction for a mix of environments across the landscape. A forest plan divides National Forest System lands into areas with similar management emphasis and settings in much the same way that city zoning zones municipalities to permit or prohibit certain land uses.

National Forest System lands within the Forest boundary have been divided into nine management areas, each with a different emphasis that is intended to direct management activities on that particular piece of land. Management area allocations are specific to the areas across the Forest with similar management needs and desired conditions.

Management area categories are listed in Table 11 and the corresponding maps can be found on the external drive of maps located in the back of the document.

Table 11. Management areas

Management Area Number	Management Area Emphasis	Estimated Acres
1	Designated Wilderness	392,138
1.1a	Recommended Wilderness	40,052
3	Roadless Areas	519,798
4.1	Special Designation: Special Interest Areas	26,939
4.2	Special Designation: Research Natural Areas	23,861
4.21	Special Designation: Scenic Byways and Railroads	27,501
4.34	Special Designation: Eligible and Suitable Wild, Scenic, and Recreational Rivers	35,869
4.8	Special Designation: Ski-based Resorts	1,632
5	General Forest and Rangeland	837,269

Overlapping Management Area Direction

Overlapping management direction occurs when a special feature occurs within another management area; for example, when a research natural area occurs within a wilderness boundary. The direction related to wilderness is the most restrictive and is established by Congress. A research natural area that occurs within a wilderness area boundary is bound by all of the laws, regulations, policies, and forest plan direction that apply to wilderness as well as by direction related to the management of that individual research natural area.

For Management Area 1.1 – Designated Wilderness, any management proposed in areas where other management areas overlap would be done in compliance with wilderness direction. Overlapping management areas are described below.

Approximately 11,482 acres of Management Area 4.2 – Special Designation: Research Natural Areas occur within the boundaries of designated wilderness. Regional foresters and station directors establish new research natural areas. These areas are used as a baseline for measuring ecological changes and as control areas for evaluation and monitoring. Research natural areas that overlap with designated wilderness include three areas in the Sangre de Cristo Mountains: the Mill Creek, Deadman Creek, and North Zapata Research Natural Areas. A portion of the Mill Creek Research Natural Area overlaps with recommended wilderness as well.

An estimated 15,575 acres of designated wilderness is also managed as Management Area 4.34 – Special Designation: Eligible and Suitable Wild, Scenic, and Recreational Rivers. These areas would be managed to enhance or maintain the outstandingly remarkable features responsible for river designation while complying with wilderness practices and restrictions. Approximately 161 acres of Management Area 4.34 overlap with Management Area 1.1a – Recommended Wilderness. Additionally, an estimated 483 acres of research natural area (Management Area 4.34) overlap with special interest area (Management Area 4.1) and wilderness (Management Area 1). Management proposed on these acres would have to be in compliance with wilderness requirements if that area is carried forward in the analysis of wild, scenic, and recreational river direction and any direction for that specific special interest area.

Approximately 7,313 acres of overlapping management area occurs with research natural areas (Management Area 4.2) and designated eligible and suitable wild, scenic, and recreational rivers (Management Area 4.34). Management activities that might occur in these areas would need to be in compliance with all management areas.

Approximately 856 acres of recommended wilderness (Management Area 1.1a) overlap with Management Area 4.34 – Special Designation: Eligible and Suitable Wild, Scenic, and Recreational Rivers and Management Area 4.1 – Special Designation: Special Interest Areas.

An estimated 2,947 acres of recommended wilderness (Management Area 1.1a) overlap with existing special interest areas (Management Area 4.1). Any activities or management proposed in this area would have to be done in compliance with wilderness practices and meet direction for that specific special interest area.

Overlapping management areas also occur in Management Area 4.2 for research natural areas. As stated previously, the most restrictive management direction would apply when working in areas with overlapping direction. When this occurs, the most restrictive level of management would be the most constraining.

Research natural areas also overlap with the acres designated as Colorado roadless areas. The 5,018 acres overlap with roadless areas in the Finger Mesa Research Natural Area on the Divide Ranger District. If management were to occur on these acres, it would have to be compliant with both the direction for the research natural area and the roadless designation. Estimated acreage of management areas is listed in Table 11.



Figure 12. Rio Grande Pyramid in fall

Management Area 1 – Wilderness

Desired Conditions

Wilderness is designated by Congress and managed in accordance with the Wilderness Act of 1964. Management in these areas protects and perpetuates natural ecological processes and conditions. Natural ecological conditions in designated wilderness are not measurably affected by human use. Management of these area protects the overall wilderness character as described in the Wilderness Act. Approximately 23 percent of the Forest, 430,000 acres, is designated as wilderness. The La Garita, Sangre de Cristo, South San Juan, and Weminuche Wilderness areas all occur on the Rio Grande National Forest. All of these areas are jointly managed, and a lead forest is identified for each wilderness area. Each of the four wilderness areas has a specific wilderness plan to direct and guide management.

Natural succession, influenced by natural processes and disturbances, occurs in all vegetation types. Structure, composition, function, and spatial distribution of vegetative types are the result of natural succession. Where no natural disturbance has occurred, vegetation is mostly in late-successional stages.

Age and structure classes may vary where natural disturbance agents, such as fire or insects, have influenced the succession process. Plant species are native and indigenous to the immediate area. Populations of nonnative invasive plant species are limited, and ongoing management activities control existing populations and eradicate new species before they can become

established. Forage for wildlife, permitted livestock, and packstock is available in meadows and natural openings. Forage availability may be limited due to topography and short growing seasons. Human influences on vegetation is minimal. Timber harvest is prohibited and this area is not included in the suitable timber base.

Wildlife species are buffered from human influences. No nonnative animal species are introduced. Human influence on aquatic life and riparian areas and processes is minimal in most areas. The composition, structure, and function of aquatic ecosystems are minimally disturbed by human influence. Stocking is used as a tool to enhance threatened, endangered, and candidate species and to enhance recreational opportunities where stocking occurred prior to designation. Water impoundments, ditches, and diversions may be present in designated wilderness areas.

Designated wilderness areas favor solitude; users are expected to be familiar with and use primitive skills in an environment that offers a high degree of risk and challenge. Success or failure is directly dependent on the ability, knowledge, and initiative of the visitor. Contact with other users or Forest Service personnel decreases with increasing distance from the entry portals. Near the entry portals, users may have contact with larger groups. Commercial permitting for day-use activities is allowed in high-use areas. Evidence of established campsites and base camps may be present. An element of discovery is maintained. The presence of interpretive signs, markers, and posts decreases with increasing distance from the entry portals, though cairns may be present. Near the entry portals, trails are marked at intersections to indicate routes. Evidence of cultural and historic sites may be present, and these sites may be signed and interpreted near entry points. Structures or facilities may be present but only as necessary for resource protection when less obtrusive measures were not successful in the past. Human influence on physical features, such as soil and geologic materials, is minimal. Outfitter-guides provide special use recreation services that fulfill identified public needs and support the recreational or wilderness purpose.

Trails provide access for the primary mode of travel from entry portals. Trail systems favor user safety and comfort. Bridges may be present when needed for resource protection or user safety. The presence of constructed trails decreases with increasing distance from entry portals, and travel deep within wilderness is primarily cross-country with no established trails. User-created trails may exist but are not maintained or designated on maps or trail guides. Trails support wilderness experiences and preserve wilderness characteristics.

Evidence of past mining activity may be present but is rare. Designated wilderness areas are withdrawn from locatable mineral entry and are legally unavailable for oil and gas leasing.

Visibility is generally unimpaired. Smoke from wildfires may be visible. The scenic integrity ranges from very high to high, and the recreation opportunity spectrum class ranges from primitive to semi-primitive nonmotorized.

Forestwide desired conditions applicable to wilderness are also contained in Chapter 2.

Management Area Specific Management Approaches

Existing trails are primitive and maintained to minimize resource damage. The following actions will be taken as needed:

- Reduce evidence of trails
- Eliminate duplicate routes

- Remove trails from maps where repeated travel over the same route is to be discouraged.

Signs are restricted to trail intersections. Bridges and other reminders of management control are generally limited to those needed for resource protection and user safety, and generally use native materials.

Bridges are built for resource protection and user safety, not for user convenience, using native materials.

Signage and other infrastructure is minimal and constructed of rustic, native, or natural-appearing materials.

Eligible and listed historic structures are managed to be compatible with the wilderness setting.

Campsites are maintained in Frissell-Cole Class 2 or 3.

Fish stocking emphasizes a wild fishery, where species perpetuate themselves over time and are affected primarily by the forces of nature. Some high mountain lakes may be stocked to support indigenous threatened, endangered, and proposed species as well as species of conservation concern. Species of fish that are not indigenous to the area or that are exotic will not be stocked.

Rockhounding activity must not exceed 50 pounds per person per day or interfere with existing rights, and specimens may only be collected for personal, noncommercial uses.

Voice control or physical restraints are acceptable to prohibit pets from harassing wildlife or people.

The Forest will consider the following to minimize human impacts in wilderness:

- Limit the number of private outfitter-guide camps
- Encourage the use of self-contained stoves or prohibit campfires
- Implement a permit system
- Implement party-size and pack-animal limitations
- Prohibit dogs or implement an on-leash requirement.

Where appropriate, printed wilderness information is posted at trailheads outside of the wilderness boundary.

Restoration activities (e.g., prescribed fire, active weed management) may be used in recommended wilderness areas to protect or enhance the wilderness characteristics.

Significant historic structures can be considered as having cultural values and, when present, may be eligible for protection or restoration.

Management Area Specific Standards

S-MA 1-1: Protect and preserve wilderness values and character in congressionally designated wilderness, as well as in areas recommended for wilderness designation.

S-MA 1-2: Activities permitted by special use permit within wilderness:

- Will involve minimal physical, visual, and noise disturbance
- Will not result in permanent structures, except for replacements or mandatory repairs to existing facilities previously authorized or allowed by statute

- May exceed the group size limitation when the activity:
 - Will benefit the wilderness character
 - Is necessary for public health and human safety.

S-MA 1-3: Group size may not exceed more than 15 people per group, with a maximum combination of people and stock not to exceed 25.

S-MA 1-4: Unless justified by terrain, prohibit recreational livestock within 100 feet of lakes and streams.

Management Area Specific Guidelines

G-MA 1-1: Pristine management areas of a wilderness should not be changed to a lesser standard of naturalness in order to disperse recreation use from other parts of the wilderness.

Management Area Specific Land Suitability

SUIT-MA 1-1: Designated wilderness areas are not suitable for removal of salable mineral material including but not limited to sand, stone, and gravel.

SUIT-MA 1-2: Wilderness areas are not included in the suitable timber base.

SUIT-MA 1-3: Wilderness areas are not suitable for commercial use of non-timber forest products, including but not limited to firewood, posts, and boughs.

SUIT-MA 1-4: Grazing is permitted.

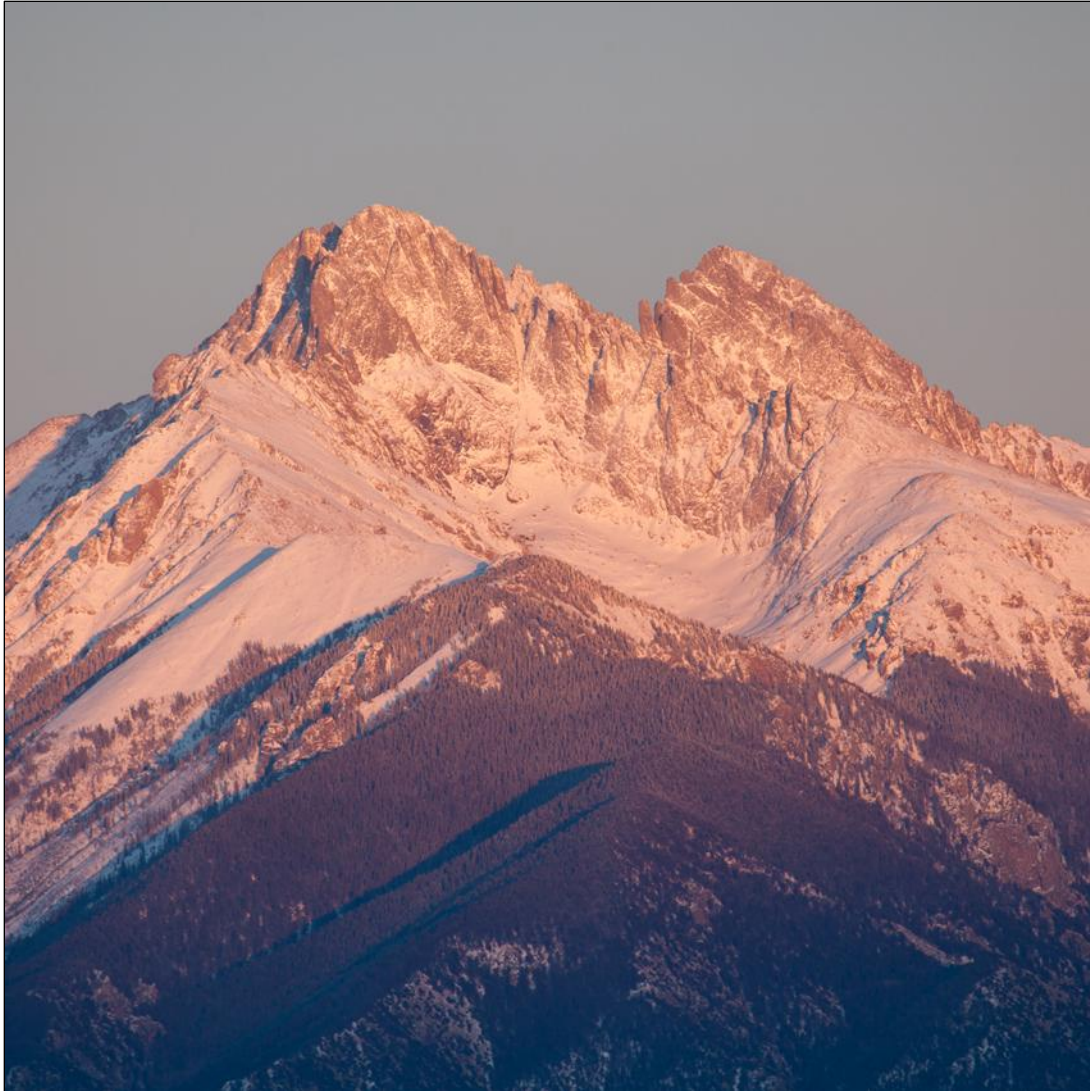


Figure 13. Crestone Peak

Management Area 1.1a – Recommended Wilderness

These are areas that are recommended future inclusion in the National Wilderness Preservation System. The Forest Service only recommends these lands. Decisions to designate these lands as wilderness is made by the U.S. Congress. Congress, and ultimately the President, must establish legislation, through a wilderness bill, to officially designate a wilderness area.

The specific areas being recommended include an estimated 40,052 acres located in the Sangre de Cristo range.

Management Area Specific Desired Conditions

Recommended wilderness areas preserve opportunities for inclusion in the National Wilderness Preservation System. The Forest maintains and protects the ecological and social characteristics that provide the basis for wilderness recommendations.

These areas are characterized by a natural environment where ecological process such as natural succession, wildfire, avalanches, insects, and disease function with limited human interaction.

Management Area Specific Guidelines

G-MA 1.1a-1: To maintain and protect wilderness characteristics, communications sites for public safety should be located outside of recommended wilderness areas unless no other alternative is available. Communications sites that need to be located in recommended wilderness should blend with the environment and be located away from system trails and developed use sites.

G-MA 1.1a-2: To maintain and protect wilderness characteristics, new developed recreation facilities with provisions for user comfort, such as picnic tables, fire grills, and vault toilets, should not be installed.

Management Area Specific Land Suitability Determinations

SUIT-MA 1.1a-1: Recommended wilderness areas are not suitable for timber harvest.

SUIT-MA 1.1a-2: Recommended wilderness areas are suitable for restoration activities where the outcomes will protect the wilderness characteristics of the area, as long as the ecological and social characteristics that provide the basis for wilderness recommendation are maintained and protected.

SUIT-MA 1.1a-3: Recommended wilderness is not suitable for road construction or reconstruction.

SUIT-MA 1.1a-4: Recommended wilderness areas are not suitable for removal of salable mineral materials, including but not limited to sand, gravel, and stone.

SUIT-MA 1.1a-5: Mechanized transport and motorized use are not suitable in recommended wilderness.

Management Area 3 – Colorado Roadless Areas

Roadless areas emphasize protection of roadless area values and characteristics. The Colorado Roadless Rule was enacted on July 3, 2012. The Colorado Roadless Rule provided management direction to conserve 4.2 million acres of National Forest System lands statewide for roadless values, including approximately 519,798 acres in 53 areas of the Forest.

The Colorado Roadless Rule is being wholly incorporated into forest plan direction. The areas designated in the Colorado Roadless Rule are contained in Table 12.

Table 12. Roadless areas in the Forest established by the 2012 Colorado Roadless Rule

Roadless Area Name	Includes Upper Tier Acres	Roadless Area Name	Includes Upper Tier Acres
Alamosa River	Yes	Lake Fork	Yes
Antora Meadows–Bear Creek	Yes	Lower East Bellows	Yes
Beartown	Yes	Middle Alder	Yes
Beaver Mountain	Yes	Miller Creek	No

Roadless Area Name	Includes Upper Tier Acres	Roadless Area Name	Includes Upper Tier Acres
Bennett Mountain–Blowout–Willow Creek–Lion Point–Greenie Mountain	Yes	Pole Creek	No
Big Buck–Kitty–Ruby	Yes	Pole Mountain–Finger Mesa	Yes
Box-Road Canyon	Yes	Red Mountain	Yes
Bristol Head	Yes	Ruby Lake	Yes
Butterfly	No	Sawlog	Yes
Chama Basin	Yes	Sheep Mountain	Yes
Conejos River–Lake Fork	No	Silver Lakes–Stunner	Yes
Copper Mountain–Sulphur	Yes	Snowshoe Mountain	Yes
Cotton Creek	No	Spectacle Lake	No
Crestone	No	Spruce Hole–Sheep Creek	Yes
Cumbres	Yes	Stunner Pass–Dolores Canyon	Yes
Deep Creek–Boot Mountain	Yes	Sulphur Tunnel	No
Dorsey Creek	Yes	Summit Peak–Elwood Pass	Yes
Elkhorn Peak	Yes	Taylor Canyon	Yes
Fourmile Creek	Yes	Tewksberry	Yes
Fox Creek	Yes	Tobacco Lakes	Yes
Fox Mountain	Yes	Trout Mountain–Elk Mountain	Yes
Gibbs Creek	No	Ute Pass	Yes
Gold Creek–Cascade Creek	Yes	Wason Park	Yes
Hot Springs	No	Wightman Fork–Upper Burro	Yes
Indiana Ridge	Yes	Wightman Fork–Lookout	Yes
Kitty Creek	No	Willow Mountain	Yes
La Garita	Yes		

The intent stated in the Colorado Roadless Rule “is to protect roadless values by restricting tree cutting, sale, and removal; road construction and reconstruction; and linear construction zones within Colorado Roadless Areas, with narrowly focused exceptions.” (Federal Register, vol. 77, no. 128, Tuesday July 3, 2012, pp. 39602-39612). Colorado roadless areas are included in Management Area 3 – Roadless. A detailed description of this management area and the accompanying direction is available in the 2012 Colorado Roadless Rule (36 CFR Part 294). Motorized and mechanized use can occur in these areas.

Desired Conditions

Colorado roadless areas are generally undeveloped parts of the Forest that provide a variety of settings at different elevations. They are managed to protect roadless characteristics and to maintain plant and animal habitats that are shaped primarily through natural processes. These areas provide backcountry recreational experiences to the public in areas with less evidence of human activities.

Landscapes in these areas are predominantly natural appearing and relatively undisturbed by humans. Natural processes within the context of the range of natural variability (insects, disease, and fire) are generally allowed to occur with minimal human intervention.

The probability of experiencing solitude in these areas is high. Frequent opportunities for challenge and risk require a degree of self-reliance. Facilities are minimal and exist primarily for site protection. Recreational improvements, such as signs, may be present. Trailheads offer information and directional signage.

Trails provide access for a wide range of challenging recreational opportunities including horseback riding, mountain bike riding, and motorized travel on designated routes. Cross country (off trail) motorized travel is limited to over-the-snow use unless otherwise prohibited. Hunting and fishing opportunities are available for those seeking a more remote experience.

The number of miles of motorized and nonmotorized trails will not substantially change over the planning period. Activities meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Management Area Specific Standards

S-MA3-1: The Colorado Roadless Rule direction at 36 CFR 294 Subpart D will be followed.

Management Area 4 – Special Designations

Management Area 4 emphasizes recreation and scenery. The five divisions represent areas that are designated for specific reasons that can include research; unique special areas; scenery; wild, scenic, and recreational rivers; and ski resorts.

Features in these areas are often interpreted to increase public knowledge of the areas and the features that are present there as well as to connect people with the land and the natural environment.

Some areas are included in the suitable timber base and are available for commercial timber harvest.

Management Area 4.1 – Special Designation – Special Interest Areas

Desired Conditions

Special interest areas favor the protection or enhancement of unique characteristics that occur across the Forest. Special interest areas typically contain unique botanical, geologic, historical, scenic, or cultural areas and values. Education and interpretation of the characteristics for which the area was designated are encouraged and are accomplished in consultation with partners, private citizens, tribes, and other agencies.

Management Area Specific Management Approaches

Facilities are designed to meet management objectives.

Vegetation treatment may be used to maintain or enhance special or unique values of the area.

Special use permits are appropriate for scientific or educational activities that are compatible with the values for which the area was created.

Management plans explain and protect the values for which the area was created.

Management Area Specific Guidelines

G-MA4.1-1: Activities should meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Management Area Specific Land Suitability

SUIT-MA4.1-1: Grazing is permitted unless it is in conflict with the values for which that area was created.

SUIT-MA4.1-2: These areas may be suitable for timber production.

SUIT-MA4.1-3: These areas are available for oil and gas leasing with no surface occupancy.

Management Area 4.2 – Special Designation – Research Natural Areas

Desired Conditions

Research natural areas preserve representative areas with important forest, shrubland, grassland, alpine, aquatic, geologic, or other natural environments. They may have special or unique characteristics, or scientific importance. The management emphasis of these areas focuses on protecting or enhancing unique or exemplary ecosystems designated for non-manipulative research, monitoring, and education.

Research natural areas contribute to the preservation and maintenance of key elements of biological diversity at the genetic, species, population, community, and landscape levels. These areas are intended as baseline areas for measuring ecological changes, and as control areas for evaluation and monitoring.

Management Area Specific Management Approaches

Low-impact uses such as camping, fishing, horseback riding, and hunting can occur unless otherwise restricted. Increases in recreation use that would threaten or interfere with the objectives or purposes for which a research natural area was established should be restricted.

Trails created prior to establishing the area can continue to be used for recreation and scientific research or educational access, unless values for establishment of the area are threatened. No new trail construction should occur unless needed to correct resource damage from existing trails.

Outbreaks of native insects and diseases should proceed without intervention unless they are a substantial threat to important resources outside of the research natural areas. Control methods for insect and disease outbreaks that minimize disturbance are used.

Habitat manipulation may occur for the protection of threatened, endangered, and proposed species, or in locations where it is necessary to perpetuate or restore natural conditions.

Special uses that do not conflict with the values for which the research natural area was established may continue. Proposals for non-manipulative research should be approved by the station director and the district ranger before implementation.

Comprehensive management plans should be developed in coordination with Forest Service Research personnel.

Where feasible, undesirable nonnative plant and animal species should be managed.

Management Area Specific Standards

S-MA4.2-1: Prohibit motorized and mechanized use, except when necessary for research or educational access.

Management Area Specific Guidelines

G-MA4.2-1: Activities should meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Management Area Specific Land Suitability

SUIT-MA4.2-1: Livestock grazing is permitted when it is not in direct conflict with the resource values that prompted establishment of the area. Permitted livestock grazing is allowed in the Hot Creek Research Natural Area. This area is part of the Hot Creek Allotment, which is under a valid grazing permit. The current permittees have agreed to avoid grazing the area inside of the boundary of the Hot Creek Research Natural Area.

SUIT-MA4.2-2: Recreational livestock grazing is permitted unless it threatens the values for which the area was established.

SUIT-MA4.2-3: These areas are not suitable for timber production.

SUIT-MA4.2-4: These areas are available for oil and gas leasing with no surface occupancy.

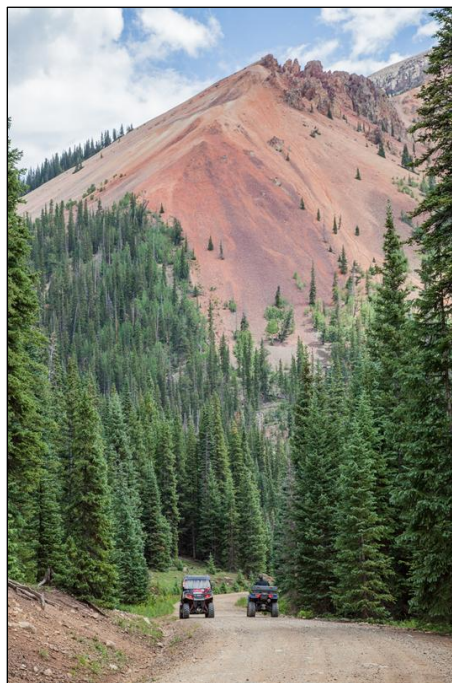


Figure 14. ATV riders near Lookout Mountain on the Conejos Peak Ranger District

Management Area 4.21 – Special Designation – Scenic Byways and Scenic Railroads

Desired Conditions

These areas are managed to protect or preserve the scenic and recreation values and uses in designated scenic byways and scenic railroad corridors while concurrently managing the multiple-use values of the landscape. This management prescription applies to the Silver Thread and Los Caminos Antiguos Scenic Byways, and the Cumbres and Toltec Scenic Railroad and National Historic Landmark.

Multiple-use management activities such as commercial timber harvest, wildlife management, recreation activities, and mineral extraction are present but not dominant on the landscape. Features may be interpreted for the public. Facilities may be developed to enhance opportunities for viewing scenery and wildlife. Activities and interactions are managed to maintain the scenic beauty for which the area is designated.

Opportunities for solitude are limited. Visitors can expect frequent contact with other visitors. Roads, recreation facilities, range improvements, and other developments are evident but are managed to be in harmony with the natural environment. Recreation facilities could include scenic overlooks, interpretive signs, and rest areas as appropriate. Developed campgrounds are situated off the main travelway. Trailheads are easily accessible, but also are situated off the main travelway.

Road systems are well signed and roads are generally passable by passenger car. This area has access for motorized recreation activities off of designated roads and trails. Nonmotorized activities such as biking and horseback riding are focused on the available trails and roads.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

Vegetation management maintains or enhances viewing opportunities.

Management Area Specific Land Suitability

SUIT-MA4.21-1: These areas are suitable for timber production.

SUIT-MA4.21-2: Grazing is permitted unless otherwise restricted.

SUIT-MA4.21-3: These areas are available for oil and gas leasing with controlled surface use.

Management Area 4.34 – Special Designation – Eligible and Suitable Wild, Scenic, and Recreational Rivers

Desired Conditions

Congress created the National Wild and Scenic Rivers System in 1968 (Public Law 90-542) to preserve selected rivers that have outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act seeks to protect these rivers while at the same time acknowledging the benefits and

necessity of appropriate developments within the river corridor. A detailed description of the application of the Wild and Scenic Rivers Act to the Forest is contained in Appendix B.

No river segments have been designated under the Wild and Scenic Rivers Act. The eligible and suitable river segments listed in Table 13, with the exception of Deadman Creek, were in the 1996 forest plan. The outstandingly remarkable values identified in the 1996 forest plan remain applicable today. Segments of Medano and Little Medano Creeks have been removed from the inventory of eligible streams because they are now administered by the National Park Service (Great Sand Dunes National Park and Preserve Act of 2000).

Management areas for eligible and suitable wild, scenic, and recreational river segments extend a minimum of one-quarter mile on either side of the mean high water mark, but may be larger to protect identified outstandingly remarkable values.

Activities meet the assigned recreation opportunity spectrum class and scenic integrity objectives.

Forest Service Handbook 1909.12, 2015-1, Chapter 80 prescribed the following desired conditions for all eligible or suitable river segments:

- The outstandingly remarkable values that were identified for each eligible or suitable river segment are preserved or enhanced until the river segment is designated or released from consideration.
- The current free-flowing nature of all eligible or suitable river segments is preserved or enhanced until the river segment is designated or released from consideration.
- The water quality of all eligible or suitable river segments is preserved or enhanced until the river segment is designated or released from consideration.
- On all eligible or suitable river segments, the conditions that lead to classification as wild, scenic, or recreational are preserved or enhanced such that no segments are changed from wild to scenic or recreational, or from scenic to recreational.

Table 13. Eligible and suitable river segments for inclusion in the National Wild and Scenic Rivers System

Stream or River Name	Length (miles) ¹	Acres	Status	Outstandingly Remarkable Values	Classification
Archuleta Creek	5.69	1,889	Eligible	Scenic, Recreational	Scenic
Deadman Creek	3.26	1,087	Eligible	Scenic, Recreational, Historic, Biological	Scenic
East Fork Rio Chama	3.18	1,078	Eligible	Scenic, Recreational	Scenic
Hansen Creek	6.72	2,067	Eligible	Scenic, Recreational	Wild
Lower Rio de los Pinos	4.50	1,364	Eligible	Scenic, Recreational, Historic	Scenic
Lower Rio Grande	4.42	1,081	Eligible	Scenic, Recreational, Historic	Recreational
Rio Grande (Box Canyon)	8.73	2,720	Eligible	Scenic, Recreational, Historic	Scenic
Saguache Creek	8.40	2,478	Eligible	Scenic, Historic, Cultural	Wild
Toltec Creek	2.88	525	Eligible	Scenic, Recreational, Historic	Wild
West Bellows Creek	6.31	2,065	Eligible	Scenic, Recreational, Geologic	Scenic

Stream or River Name	Length (miles) ¹	Acres	Status	Outstandingly Remarkable Values	Classification
West Fork Rio Chama	4.81	1,239	Eligible	Scenic, Recreational	Scenic
South Fork Rio Grande					
South Fork Rio Grande (above Big Meadows Reservoir)	5.19	1,633	Eligible	Scenic, Recreational, Historic	Scenic
South Fork Rio Grande (below Big Meadows Reservoir)	11.98	3,016	Eligible	Scenic, Recreational, Historic	Recreational
South Fork Rio Grande Total	17.17	4,649	NA	NA	NA
Conejos River					
El Rito Azul	3.80	1,168	Suitable	Scenic, Recreational, Wildlife	Wild
North Fork Conejos River	3.93	1,208	Suitable	Scenic, Recreational, Wildlife	Wild
Middle Fork Conejos River	4.59	1,411	Suitable	Scenic, Recreational, Wildlife	Wild
Conejos River (Three Forks to Platoro Reservoir)	3.33	1,023	Suitable	Scenic, Recreational, Wildlife	Wild
South Fork of the Conejos River	12.76	3,985	Suitable	Scenic, Recreational, Wildlife	Wild
Conejos River below Platoro Reservoir	12.54	3,539	Suitable	Scenic, Recreational, Wildlife	Recreational
Conejos River Total	40.95	12,334	NA	NA	NA
Wild Rivers Subtotal	46.41	13,865	NA	NA	NA
Scenic Rivers Subtotal	41.67	13,075	NA	NA	NA
Recreational River Subtotal	28.94	7,636	NA	NA	NA
Rio Grande National Forest Total	117.02	34,576	NA	NA	NA

¹ Length, in miles, of the reaches has been updated from the 1996 forest plan to reflect the best available information; changes do not reflect alterations to the eligible or suitable river segments.

Management Area Specific Management Approaches

A suitability analysis should be initiated when a proposed action threatens the free-flowing nature, outstandingly remarkable values, water quality, or scenic classification of an eligible or suitable river segment.

The Forest will engage the local community on the status of eligible or suitable wild, scenic, and recreational river segments and include information on currently decreed federal reserved water rights in Colorado Water Division 3 (81CW183).

Management Area Specific Standards

S-MA4.34-1: Management actions preserve the classification, outstandingly remarkable values, and water quality of eligible and suitable river segments.

S-MA4.34-2: Consistent with existing water rights decrees in Colorado Water Division 3 (81CW183), the free-flowing nature of eligible and suitable river segments shall be preserved.

S-MA4.34-3: For eligible and suitable river segments, the width of the management area may vary to protect outstanding values, but will extend at least one-quarter mile on either side of the river segment.

Management Area Specific Guidelines

G-MA4.34-1: Management actions within the river corridors of eligible and suitable river segments shall be consistent with management direction contained in FSH 1909.12, Chapter 80, Section 84, or current direction.

G-MA4.34-2: For eligible or suitable wild river segments:

- The recreation opportunity spectrum class is primitive
- The scenic integrity objective is very high.

G-MA4.34-3: For eligible or suitable scenic river segments:

- The recreation opportunity spectrum class is semi-primitive motorized
- Activities will meet the adopted scenic integrity objective.

G-MA4.34-4: For eligible or suitable recreational river segments:

- The recreation opportunity spectrum class is semi-primitive motorized
- Activities will meet the adopted scenic integrity objective.

Management Area Specific Land Suitability

SUIT-MA4.34-1: Rivers or segments that are eligible and suitable and are designated as wild or scenic are not suitable for timber production.

SUIT-MA4.34-2: Rivers or segments that are eligible for recreational status are suitable for timber production.

SUIT-MA4.34-3: In designated wilderness, eligible and suitable wild rivers or segments are either legally withdrawn or administratively unavailable from mineral entry.

SUIT-MA4.34-4: Eligible and suitable scenic rivers or segments are authorized for oil and gas leasing with a controlled surface use stipulation.

Management Area 4.8 – Ski-based Resorts

Desired Conditions

These areas are managed for their existing or potential use as ski-based resort sites. Wolf Creek Ski Area is the only resort permitted on the Forest. This is an area of concentrated use where visitors can expect a high degree of interaction and many facilities associated with the ski resort industry.

Protection of recreation resources and public safety, including management of insects and disease, is the primary focus. Project implementation in this area maintains the possibility of winter sports recreation. Resource management activities are designed and implemented to maintain or enhance existing resources.

Development in the area will be consistent with the terms and conditions of the special use permit, including submission of a master development plan. These lands are withdrawn from locatable mineral entry.

Facilities are designed and constructed to blend with the natural area. Line and form, indicating past activities, and geometric shapes associated with ski-trail and lift development should be “softened” as opportunities become available.

Activities should meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Management Area Specific Management Approaches

Vegetation management is included in resort management plans.

Management Area Specific Land Suitability

SUIT-MA4.8-1: Grazing is permitted on a limited basis with the agreement and cooperation of the permit holder.

SUIT-MA4.8-2: These areas are not suitable for timber production.

Management Area 5 – General Forest and Rangelands

This management area combines several management areas that were designated in the 1996 forest plan into one large area. A variety of management activities occur, including livestock grazing, management of wildlife habitat, developed and dispersed recreation, exploration and development of minerals and energy resources, and timber harvest. Characterized by forest and grassland communities, this area is managed with a multiple-use emphasis to achieve a variety of goals.

Desired Conditions

Vegetation management goals are met using a full range of silvicultural options. Harvest rotation periods vary depending on species, site, conditions, and management objectives. Timber management activities focus on a variety of management objectives, including but not limited to timber production, habitat management, restoration and maintenance, and management to meet stated recreation objectives, maintain vegetation cover for wildlife, and protect soil stability. All successional stages are represented.

A full range of activities is present with an emphasis on the production of commercial wood products. These areas have a high potential for timber growth, and operations focus on wood production. Suitable forested areas are maintained with commercially valuable species at ages, densities, and sizes that allow growth rates and stand conditions that are conducive to providing a sustained yield of forest products.

Landscape diversity is similar to natural conditions (composition, structure, and function) and includes consideration within a spatial context—for example: what species, what kind of stand structure, and what kind of landscape patterns are natural, by ecosystem. All succession stages are represented, including old forest. Mature stands are identified for old-forest characteristics (See Appendix A).

Rangelands are composed of grassland ecosystems that maintain and improve desired vegetation conditions for livestock, wildlife, and recreational stock. These areas are characterized by a mix of grassland and forested ecosystems that features open meadows and other grasslands, intermixed with stands of aspens and conifers.

Forested cover is interspersed with grassland areas and managed so that quality forage is readily available, depending upon site-specific conditions. Cover types on winter range areas frequently consist of lower-elevation pinyon-juniper communities, ponderosa pine, and warm-dry ecosystem types that may include Douglas fir, white fir, and aspen. Various shrub species such as mountain mahogany, sagebrush, rabbit-brush, gooseberry, and bitterbrush are interspersed with low-elevation grasses including fescues, squirrel tail, oat-grass, and needle and thread grass. Water sources provide water for both wildlife and livestock where it is a limiting factor on the landscape.

Plant communities occur in a variety of successional stages to provide biological diversity of both plant and animal species. A variety of tools and methods is applied, including but not limited to timber harvest, prescribed burning, and planting.

Watersheds, scenic resources, and wildlife habitat are restored in locations where past management actions have reduced resource effectiveness.

This area has a well-developed transportation system that provides access for recreation opportunities and management. The area has numerous designated roads that offer commercial access and roaded recreation opportunities, while roads with restricted access offer nonmotorized recreation opportunities.

Access may be limited in some areas during the winter to reduce disturbance to wildlife. Vegetation management that occurs during the winter will have authorized access as needed. Access during other seasons is based on travel management objectives.

Prescribed road densities of 1 mile per square mile provide for critical wildlife needs, in areas used for winter concentration, critical winter range, calving areas, and transition habitat.

Where feasible, mutual population objectives are established with Colorado Parks and Wildlife to provide maximum recreation opportunities while minimizing habitat and resource conflicts. Existing and potential partnerships strive to improve or enhance habitat and species numbers.

Recreation opportunities and human disturbance are balanced to allow game species to effectively use resources while conserving energy reserves. Disturbance from motorized and mechanized activities is limited during the primary winter use period, generally from December 1 through March 31, or as needed. Winter weather conditions naturally increase secure habitat by limiting access; however, seasonal road restrictions or area restrictions are also used to attain the desired conditions.

Viewing areas provide interpretation of the resources and management.

Quality habitat provided for wildlife dispersion exists between undeveloped areas of the Forest.

Livestock grazing is present. Grazing systems are managed to provide quality forage for use by both big game species and livestock.

Appropriate settings are offered that are suitable for a broad range of recreation opportunities. Dispersed and developed recreation areas are designated mostly along road corridors where opportunities for developed and undeveloped recreation can be managed as an integrated resource. These popular areas generally have access to water features or other natural attractions and offer a more social recreation experience with frequent visitor contacts.

Insects and disease are managed to maintain the recreation resource.

Summer homes, resorts, and organizational camps are present and managed to provide unique recreation opportunities. Developed recreation sites and facilities, such as campgrounds and picnic sites, are maintained and updated to meet customer needs. Management actions in dispersed sites maintain the natural characteristics that make the area popular.

Forest visitors to these areas can expect to experience active forest management including timber harvest, livestock grazing, established infrastructure, and improvements. In timber harvest areas, stumps, logging slash, skid trails, and soil disturbance will be evident.

Activities meet the assigned recreation opportunity spectrum classes and scenic integrity objectives.

Opportunities exist for exploration and development of mineral and energy resources.

Recreation facilities are improved on the basis of user demand. Users can expect to have a more social experience.

Management Area Specific Management Approaches

Domestic livestock grazing is coordinated with vegetation management activities to ensure adequate regeneration of vegetation and prevent impacts on range improvements and natural barriers.

Retrieval of game using off-road vehicles is authorized daily from 12 p.m. to 5 p.m. when conditions would not result in damage to resources, including soils and vegetation.

Fire hazard is reduced by treating fuels consistently with other resource uses and needs.

The operating and reclamation plan for locatable minerals contains strategies to avoid or mitigate impacts to winter range. New roads should not be constructed in locations with important forage and cover.

Forage and cover is managed across the landscape to sustain ungulate populations and support population objectives.

Livestock grazing strategies are designed and managed to provide the forage quantity and quality needed to sustain desired ungulate populations during the winter period.

Grazing is suitable in only one research natural area, specifically Hot Creek Research Natural Area. Motorized and mechanized travel is suitable only on designated routes.

Communication sites and renewable energy development are also subject to project-specific environmental review. Over-snow motorized travel is suitable in only three special interest areas, specifically the Bachelor Loop, Elephant Rocks, and Wagon Wheel Gap Experimental Station, and may be subject to timing restrictions to protect deer and elk winter range.

Vegetation treatments in developed recreation areas maintain or enhance recreation opportunities or contribute to visitor safety.

User conflicts are considered when scheduling vegetation manipulation projects.

Fuels resulting from vegetation manipulation projects are treated commensurate with the risk of human-caused ignition.

Additional restrictions on high-use dispersed recreation sites are developed to protect sensitive natural resources.

Management Area Specific Standards

S-MA5-1: Off-road travel, including over-the-snow travel, is not allowed on big game winter range areas during the primary use seasons for big game (December 1 – April 15). Exceptions may be allowed under contract or special use authorizations.

Management Area Specific Land Suitability

SUIT-MA5-1: Big game winter range is not suitable for off-road travel during big game primary use seasons. Exceptions made be made for permittees or contractual obligations.

SUIT-MA5-2: This area is part of the suitable timber base.

SUIT-MA5-3: This area is suitable for grazing.

SUIT-MA5-4: These areas are suitable for oil and gas leasing with a no surface occupancy stipulation.



Figure 15. Bristlecone pine cone

Chapter 4. Monitoring

Introduction

Forest plan monitoring provides feedback for the Forest's planning cycle by testing assumptions, tracking relevant conditions, and evaluating management implementation and effects of management practices. The monitoring program that is developed as part of the forest plan should be strategic, effective, and useful. Forest plan monitoring is an important part of the continuous improvement of the plan through the adaptive management process. Direction for monitoring and evaluation of forest plans is contained in 36 CFR 219.12, and in planning directives at 1909.12, Chapter 30.

The Role of Monitoring under the 2012 Planning Rule

The National Forest Management Act requires "continuous monitoring and assessment in the field" to evaluate "the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land" (16 USC 1604(g)(3)(C)). The 2012 Planning Rule emphasizes a three-part iterative cycle of assessment, planning, and monitoring in a continuous feedback loop. Monitoring is intended to support the assessment process and evaluate plan implementation over time. This framework is designed to "inform integrated resource management and allows the Forest Service to adapt to changing conditions, including climate change, and improve management based on new information and monitoring" (§ 219.5 (a)).

Specific Requirements for Monitoring under the 2012 Planning Rule

A monitoring plan consists of monitoring questions and indicators that are designed to inform the management of resources on the Forest by testing relevant assumptions, tracking relevant changes, and measuring management effectiveness and progress toward achieving or maintaining the plan's desired conditions or objectives. The monitoring program must also be coordinated with the Regional Forester and Forest Service State and Private Forestry and Research and Development (§ 219.12 (a)(1)), and it should consider a broader-scale monitoring strategy to address monitoring questions at a geographic scale broader than one single national forest (§ 219.12 (b)). Furthermore, in developing the monitoring plan, the responsible official should also provide opportunities for public participation, "taking into account the skills and interests of affected parties," as well as the scope, methods, forum, and timing of those opportunities (§ 219.4 (a)). This monitoring plan was informed by public input received throughout the development of the forest plan.

Monitoring may involve evaluating if standards and guidelines are implemented (implementation monitoring), if management actions, standards, and guidelines are effective in achieving goals and objectives (effectiveness monitoring), the long-term trend, and condition of key resources (condition or surveillance monitoring). At a minimum, the plan monitoring program must contain one or more monitoring questions and associated indicators that address the following eight items (see §219.12[a][5][i-viii]):

- i. The status of select watershed conditions,

- ii. The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems,
- iii. The status of focal species to assess the ecological conditions required under § 219.9,
- iv. The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern,
- v. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives,
- vi. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area,
- vii. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities, and
- viii. The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).

A monitoring evaluation report will be produced and published every two years (§ 219.12 (d)). It “must indicate whether or not a change to the plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information... [and] must be used to inform adaptive management of the plan area” (§ 219.12 (d)(2)). The monitoring program and evaluation report are part of the administrative record (§ 219.14 (b)), and the forest supervisor must document “how the best available scientific information was used to inform planning, the plan components, and other plan content, including the plan monitoring program” (§219.13 (a)(4)).

Best Available Scientific Information and Fiscal Constraints

Evaluating ecosystem integrity and sustainability requires the synthesis and interpretation of high quality data and information from multiple scales of social and ecological organization. While the 2012 Planning Rule directs national forests to use the best available scientific information for plan monitoring, it also recognizes the need to remain within the financial capabilities of the unit. To meet these goals, the proposed forest plan monitoring strategy supplements data and information collected by Forest staff using the best available scientific information available from Forest Service Research and partners, within existing staffing and budgetary limitations. The monitoring questions and indicators contained here rely heavily on federal, state, and other public partners. The protocols, data standards, and metadata from partner organizations were also considered in determining the best available scientific information. For example, reliance on the Forest Service Research’s Forest Inventory and Analysis program allows the Forest to use the longest continuous forest census and evaluate management in long-term trends observed in forest conditions. Datasets generated and maintained by partners that have been evaluated for applicability (Table 15) will inform future management, with minimal additional investment needed by the Forest.

To evaluate trends and changes in terrestrial ecological conditions, the Forest will use data and spatial products from Forest Service Research’s Forest Inventory and Analysis program, the Remote Sensing Application Center’s Monitoring Trends in Burn Severity program, LANDFIRE

(Landscape Fire and Resource Management Planning Tools project), Forest Health Monitoring program, and Bird Conservancy of the Rockies. Forest Inventory and Analysis program data represent the most robust source of information available on the status and trend associated with forest conditions at landscape scales. While the Forest Inventory and Analysis program can be used to monitor broadscale trends in forest cover and composition across regions, it can also be used to track changes in fine-grain characteristics at the landscape scale, including measures of crown cover, stand density, snags, and downed woody material that are relevant for the conservation of threatened and endangered species, and species of conservation concern (Chojnacky 2000, Witt 2015). At the same time, “coarse-grain” changes in ecological conditions at landscape scales, such as structural connectivity and patch size and distribution, may be evaluated using new and existing spatial datasets and remote sensing products from the Remote Sensing Application Center, Forest Health Monitoring program, U.S. Geological Survey, and Forest Inventory and Analysis program. Monitoring trends and changes in Gunnison prairie dog distribution in montane ecosystems, for instance, can be efficiently accomplished by using National Agriculture Imagery Program aerial photography datasets (Sidle et al. 2002). Data collected by the Bird Conservancy of the Rockies also represents an important and scientifically robust source of information. Data on breeding bird occupancy and density is important for understanding trends associated with individual species. In consultation with Bird Conservancy of the Rockies, the Forest identified a suite of bird species for monitoring that can be used to infer changes in the structure, function, and composition of forest ecosystems.

The Forest is also proposing to monitor ecological conditions in aquatic, riparian and wetland, and alpine systems using a variety of approaches. To monitor trends and changes in riparian vegetation and condition at the forest plan level, the Forest is proposing to use new products developed by the Washington Office of the Forest Service that were piloted during the assessment phase of the forest plan revision (Abood 2016). Information on key aquatic ecological conditions, such as streamflow and temperature, may also be acquired from the U.S. Geological Survey and generated through a broadscale strategy implemented in collaboration with Rocky Mountain Research Station’s NORWEST stream temperature monitoring program. Beavers are proposed as focal species for aquatic and riparian systems. After consulting with beaver and riparian systems experts at Utah State University, the Forest is proposing to monitor the number of subwatersheds (6th level or 12 digit Hydrologic Unit Code) with beaver activity over time. This is a cost-effective strategy that allows the Forest to track beaver presence and range expansion, identify potential areas where beaver introduction may be appropriate, and provide opportunities for citizen science and outreach. These approaches are complementary. For instance, information on trends in sedimentation, streamflow, riparian cover, and stream temperature are all particularly relevant for the management and conservation of many aquatic and riparian species of conservation concern, such as the Rio Grande cutthroat trout, Rio Grande chub, and Rio Grande sucker.

The Forest is also proposing to use data from partners to track trends and conditions in climatic variability and ecological conditions in alpine ecosystems. For instance, monitoring data and products from the National Oceanic and Atmospheric Administration, Oregon State’s PRISM program, Natural Resources Conservation Service SNOTEL, National Phenology Network, and National Park Service Inventory and Monitoring Program can be used to monitor drought, long-term climatic change, atmospheric deposition, vegetative phenology, and alpine vegetation and conditions across the broader plan area.

Forest Monitoring Framework

The proposed monitoring framework addresses each of the eight monitoring requirements, uses the best available scientific information, and is feasible to implement with existing resources. It is designed to promote iterative evaluation of plan components associated with social and ecological desired conditions, and to facilitate effective and efficient biennial reporting.

The proposed monitoring framework is composed of the following elements.

Goals are broad themes associated with core aspects of the Forest Service mission, including goals for social and ecological sustainability and resilience. Monitoring questions, plan components, and indicators are organized under these broad goals.

Monitoring Requirement identifies which of the eight monitoring requirements a specific question and set of indicators addresses. In many cases, questions meet the requirements of two or more monitoring requirements.

Monitoring Question is the plan-level monitoring question. Monitoring questions are priority questions of high relevance for forest planning and decision-making that can be used to test relevant assumptions, track relevant changes, and measure progress toward achieving desired conditions.

Desired Conditions are select desired conditions that represent priority goals and approaches for maintaining or improving the resilience of social and ecological conditions within and across the broader landscape context of the forest plan area.

Indicators are measurable attributes of social and ecological conditions that are used to answer monitoring questions and evaluate progress toward maintaining or achieving desired conditions.

Data Source represents the data repositories or sources of information from which measures of indicators are derived at the time the plan was developed. New data sources will likely become available as technology evolves. Similarly, data sources that exist during development of the plan may become obsolete. The Forest recognizes the need for adaptive management of the monitoring plan itself, and will incorporate changes over time as appropriate.

The data sources field also includes notes on forest responsibility, partner engagement, and broader scale monitoring. Where “forest responsibility” is noted, the Forest is the primary party responsible for collecting and interpreting this information. Where “partner engagement” is identified, the monitoring information is highly dependent on key partners and their ability to collect and interpret monitoring information. “Broader scale monitoring” indicates that this information may be better collected and evaluated at a scale larger than the Rio Grande National Forest. In most cases, broader-scale data sources are contingent on partnership information, including other federal, state, and non-governmental agencies.

Frequency describes the timing and frequency of monitoring evaluation and reporting. Evaluation and reporting frequencies are determined by the frequency of data collection and/or the spatial and temporal variability of resources (i.e., it takes several years of data collection to establish a trend for many resources).

Adaptive Management Questions: The Forest’s monitoring plan also includes adaptive management questions that are paired with most monitoring questions. These questions are intended to serve two primary functions. First, they highlight the relevancy of the monitoring

questions and data to land management decision-making. Without this lens it can be difficult to sift through volumes of data and analyses and identify salient, possibly actionable information and decision-points. Second, they offer some specific examples of ways that monitoring data may be used to identify needs to adapt our land management decisions. These needs may spring from information on changing conditions, stagnant conditions where the goal is to achieve some improvement, or new information about the status of natural resources on the Forest.

These questions are not an exhaustive list of potential management applications. Instead, they highlight some realistic ways in which monitoring data might be interpreted, evaluated, and used by line officers and land managers to inform decision-making. They are also intended to stimulate the development of additional questions among Forest staff, and they may evolve over time.

Finally, it is important to note that these questions are not intended to trigger, or require, decisions or management actions. Monitoring information is one piece of a larger puzzle that must be put together during land management decision-making processes; line officers will need to couple insights from monitoring data with other information, including resource availability, staffing capacity, multiple use priorities, and public opinion.

Goal 1

Maintain and restore sustainable, resilient terrestrial ecosystems

Monitoring questions and indicators of measure for Goal 1 are contained in Table 14.

Table 14. Forest plan-level monitoring questions and indicators of measure for Goal 1

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
4, 7	MQ1: What is the status and trend of populations of Rocky Mountain elk, Rocky Mountain bighorn sheep, and pronghorn primary use areas?	Populations of: <ul style="list-style-type: none">ElkPronghornMule deerRocky Mountain bighorn sheep	<ul style="list-style-type: none">Colorado Parks and WildlifePartnership Engagement	2 years	<ul style="list-style-type: none">Are there changes in ungulate populations that are outside of expected levels of fluctuation?If so, do they correlate with changes in habitat conditions that might be addressed through management activities?	DC-VEG-3 DC-WLDF-3 DC-WLDF-4 DC-WLDF-5 OBJ-WLDF-2 DC-SCC-7 through 9
4, 7	MQ2: What is the status and trend of forage and cover for big game species?	<ul style="list-style-type: none">Trends in forage availabilityAcres of big game habitat maintained or improved	<ul style="list-style-type: none">Forest Service Natural Resource Information System (NRIS) (data from allotments in winter range)Forest Responsibility	4 years	<ul style="list-style-type: none">Are there declines in forage availability and amount of canopy cover that could impact key wildlife species?If so, where are opportunities to address these through management activities?	DC-RNG2 DC-RNG-4 DC-WLDF-3 DC-WLDF-4 OBJ-WLDF-2
		<ul style="list-style-type: none">Acres of cover and security habitat in mapped winter range affected by disturbance/mortality	<ul style="list-style-type: none">Forest Health Monitoring programFire data	Analysis and reporting only when significant disturbance/ mortality is observed in mapped winter range		
		<ul style="list-style-type: none">Changes in crown cover in mapped winter range	<ul style="list-style-type: none">National Agriculture Imagery ProgramPartner Engagement			

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
4	MQ3: What is the status and trend of key ecosystem characteristics associated with species of conservation concern, threatened and endangered species, and resident and migratory bird species?	Landscape-level indicators <ul style="list-style-type: none"> Acres/location impacted by disturbance and management actions (i.e., in Lynx Analysis Units/lynx habitat) Distribution of old-forest/late-successional conditions 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) spatial / FSveg Forest Inventory and Analysis program. Forest Health Monitoring program – aerial surveys Monitoring Trends in Burn Severity program, or fire layers Partnership Engagement 	Analysis and reporting every 2 years (or as appropriate)	<ul style="list-style-type: none"> Are there changes to the status of at-risk species that warrant additional plan direction? Do changes to lynx habitat warrant additional plan direction? Do changes to key ecosystem characteristics for species of conservation concern warrant additional plan direction? 	DC-WLDF-1 DC-WLDF34 DC-SCC-7 DC-SCC-8 DC-SCC-6 Southern Rockies Lynx Amendment DC-TEPC-1
		<ul style="list-style-type: none"> Acres and extent of Gunnison prairie dog colonies 	<ul style="list-style-type: none"> National Agriculture Imagery Program Colorado Parks and Wildlife Health Program Partnership Engagement 	2 years	<ul style="list-style-type: none"> Are there opportunities to improve their habitat or to reduce uses that may be negatively impacting Gunnison prairie dog colonies? 	

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
4	MQ 4: What is the status and trend of ecosystem characteristics associated with species of conservation concern, threatened and endangered species, and resident and migratory bird species?	<ul style="list-style-type: none"> Fine-scale indicators: Number of live trees per acre 15-20, >20 in DBH (for all indicators, Forestwide and in major types: aspen, spruce-fir, mixed conifer) Number of live and dead trees per acre >15 inches DBH Percentage with <40, 40–70, >70 percent live crown cover Number of snags per acre 10–15, 15–20, >20-inch DBH Number of pieces of coarse woody debris (CWD) per acre 5–10, >15 inches DBH, and >15 feet long; volume of CWD per acre Mortality – net volume and percentage of dead vs. live 	<ul style="list-style-type: none"> Forest Inventory and Analysis Partnership Engagement 	<ul style="list-style-type: none"> 2 years 		DC-WLDF-1 DC-WLDF-4 DC-VEG-3 DC-SCC-7 DC-SCC-8 DC-SCC-6 Southern Rockies Lynx Amendment DC-TEPC-1
		<ul style="list-style-type: none"> Number of abandoned mines gated, and maintained for bats 	<ul style="list-style-type: none"> Abandoned Mine Lands program CNHP Partnership Engagement 	<ul style="list-style-type: none"> 2 years 	<ul style="list-style-type: none"> Are abandoned mines being inventoried for bat use and gated prior to mine closure? What is the trend in white-nose syndrome? 	

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
8	MQ5: What are the status and trends of soil productivity and function?	<ul style="list-style-type: none"> Type, degree, and extent of soil disturbance and risk rating to determine the effect of soil disturbance on soil productivity and hydrologic function 	<ul style="list-style-type: none"> Soil Disturbance Field Guide National Soils Information System (NASIS) database Soil Best Management Practices monitoring Forest Responsibility 	4 years	<ul style="list-style-type: none"> Are management prescriptions, standards, guidelines, and management approaches effectively maintaining or improving soil productivity by reducing or minimizing impacts to soil resources? If not, do they need to be changed? 	DC-SOII-1
2, 6	MQ6: What are the trends in climate including drought and long-term climate change, and how are they affecting vegetative phenology, snowpack, streamflow, and alpine vegetation?	<ul style="list-style-type: none"> Length, spatial extent, severity of drought (Palmer Drought index, Evaporative Demand Drought Index) 	<ul style="list-style-type: none"> DRI/University of Idaho Climate Engine Evaporative Demand Drought Index (WWA) Partnership Engagement Broader scale monitoring 	2 years	<ul style="list-style-type: none"> Do drought trends fall within expected ranges, or if outlier events are occurring, are there management activities that should be considered (e.g., reduction in animal unit months)? Do outlier events warrant additional or plan direction? 	
		<ul style="list-style-type: none"> Long-term trends in temperature and precipitation 	<ul style="list-style-type: none"> National Oceanic and Atmospheric Administration – National Centers for Environmental Information (NCEI) DRI/University of Idaho Climate Engine Partner Engagement Broader scale monitoring 	10 years	<ul style="list-style-type: none"> Are longer-term climatic trends consistent with those expected and underpinning current plan content? If not, is there a need for additional or forest plan direction? 	

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
		<ul style="list-style-type: none"> Snowpack/snow water equivalent 	<ul style="list-style-type: none"> USDA Natural Resources Conservation Service – SNOTEL Partner Engagement 			
		<ul style="list-style-type: none"> Trends in streamflow 	<ul style="list-style-type: none"> U.S. Geological Survey 	10 years		
		<ul style="list-style-type: none"> National Phenology Network [first bloom index] Extended spring indices 	<ul style="list-style-type: none"> National Phenology Network Partner Engagement Broader scale monitoring 	2 years	<ul style="list-style-type: none"> Do Extended Spring Indices reflect conditions that fall within ranges expected during plan development? If not, are there needs to reconsider vegetation management or other management strategies? 	
		<ul style="list-style-type: none"> Occupancy and trend of Uncompahgre fritillary butterfly colonies 	<ul style="list-style-type: none"> Uncompahgre fritillary butterfly monitoring partnership Partner Engagement 	6 and 10 years	<ul style="list-style-type: none"> How is climate change or other factors influencing vulnerable alpine systems such as snow willow, the phenology of flowering nectar plants, and occupancy of Uncompahgre fritillary butterfly colony sites? 	
		<ul style="list-style-type: none"> Alpine vegetation 	<ul style="list-style-type: none"> National Park Service / Alpine Vegetation and Soils (GLORIA) Partner Engagement 	4 years		

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
2, 6	MQ7: How are key characteristics of forest ecosystems (structure, composition, function, and disturbance regimes) changing over time, and are they within the natural range of variation?	<ul style="list-style-type: none"> Percentage cover of different forest ecosystems Percent of different structural classes in major forest ecosystems Mortality: Number of snags per acre; net volume live vs dead Regeneration: Number of saplings per acre; species composition of saplings in all ecosystem CWD: (Same as for MQ) 	<ul style="list-style-type: none"> Forest Inventory and Analysis program Partnership Engagement 	Acquisition every 5, reporting 6 and 10 years	<ul style="list-style-type: none"> Do key characteristics of vegetation structure and composition fall within the desired conditions, or are changes trending in this direction? If not, what is the role of climatic variability, management actions, and disturbance frequencies and intensities in driving these patterns? Where are management actions most likely to be effective for reducing the potential severity of disturbances and improving vegetative conditions? 	DC-SCC-1 DC-SCC-2 DC-SCC-3 DC-SCC-4 DC-SCC-5 DC-SCC-6 DC-VEG-1 DC-VEG-4
		<ul style="list-style-type: none"> Changes in fire regime condition class 	<ul style="list-style-type: none"> Landscape Fire and Resource Management Planning Tools project (LANDFIRE) 			
		<ul style="list-style-type: none"> Size and severity of fires >1,000 acres (net change in volume / Number of live vs dead trees) Number and acres of all fires 	<ul style="list-style-type: none"> Monitoring Trends in Burn Severity program Forest Service Activity Tracking System (FACTS) Spatial FSVeg Partnership Engagement 	Reporting cycle after years with fires larger than 1,000 acres		

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Adaptive Management Questions	Associated Plan Component
		<ul style="list-style-type: none"> Acres / location of vegetation management in different forest types 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) Spatial FSVeg Forest Responsibility 	2 years		OBJ-VEG-1
		<ul style="list-style-type: none"> Extent of insect mortality 	<ul style="list-style-type: none"> Forest Health Monitoring program Partnership Engagement 			
3	MQ 8: What is the status and trend of upland species?	<ul style="list-style-type: none"> Bird guilds 	<ul style="list-style-type: none"> Bird Conservancy of the Rockies Partnership engagement 	2 years		DC-WLDF-1 OBJ-WLDF-1

Goal 2

Protect and restore watershed health, water resources, aquatic ecosystems, and the systems that rely on them

Monitoring questions and indicators of measure for Goal 2 are contained in Table 15.

Table 15. Forest plan-level monitoring questions and indicators of measure for Goal 2

Monitoring Requirement	Monitoring Question	Indicator	Data Source and Responsibility	Frequency	Adaptive Management Questions	Associated Plan Component
7	MQ9: What is the status of progress toward meeting objectives identified in this plan?	<ul style="list-style-type: none"> Objectives identified in this plan, and progress status toward those objectives. 	<ul style="list-style-type: none"> Projects implemented on the Forest Forest responsibility 	2 years		
2, 4, 6	MQ10: What is the status and trend of aquatic ecosystem conditions	<ul style="list-style-type: none"> Stream temperature 	<ul style="list-style-type: none"> Rocky Mountain Research Station – NORWEST Partner Engagement Broader scale monitoring 	4 years	<ul style="list-style-type: none"> Do stream temperatures and future projections point to areas where cold-water fish habitat may be maintained? Coupling this with other riparian vegetation condition data, are there restoration opportunities in these places that might be priorities? 	DC-SCC-3 DC-FISH-1 DC-FISH-2 DC-GDE-1 DC-WA-1 DC-WA-3 DC-NNIS-1 DC-RNG-4 DC-RNG-3 DC-RMZ-4 DC-RMZ-2
		<ul style="list-style-type: none"> Number of fish barriers removed/improved 	<ul style="list-style-type: none"> Forest Service Activity Tracking System (FACTS) / fisheries reports Forest Responsibility 	2 years	<ul style="list-style-type: none"> Is the Forest achieving goals for improving fish habitat connectivity, or is there a need to increase this effort? 	
		<ul style="list-style-type: none"> Macroenthic invertebrates 	<ul style="list-style-type: none"> Forest staff macro-monitoring 	2–4 years	<ul style="list-style-type: none"> Do trends in macroenthic invertebrate communities point to the need for adjusting management practices or implementing restoration activities? 	
		<ul style="list-style-type: none"> Beaver 	<ul style="list-style-type: none"> HUC-12 	2 years	<ul style="list-style-type: none"> Where other aquatic 	

Monitoring Requirement	Monitoring Question	Indicator	Data Source and Responsibility	Frequency	Adaptive Management Questions	Associated Plan Component
		presence/absence	watersheds or stream reaches with beaver activity <ul style="list-style-type: none"> Forest Responsibility 		ecosystem indicators suggest potential restoration needs, are beavers absent, and if so, would beaver relocation be beneficial?	
		<ul style="list-style-type: none"> Presence/distribution of nonnative aquatic invasive species and pathogens Acres/miles treated 	<ul style="list-style-type: none"> Colorado Parks and Wildlife / <u>U.S. Geological Survey- Nonindigenous Aquatic Species (NAS)</u> <u>Partnership Engagement</u> <u>Broader scale monitoring</u> 	2 years	<ul style="list-style-type: none"> Are nonnative aquatic invasive species and pathogens such as chytrid fungus spreading, and if so, are there control efforts that could be considered? 	
		<ul style="list-style-type: none"> Trends in streamflow 	<ul style="list-style-type: none"> U.S. Geological Survey Colorado Division of Water Resources Partnership Engagement 	4 years	<ul style="list-style-type: none"> Is there an increase in the number of impaired streams, and if so, are there measures that can be adopted to curb this increase? Are there measures that could be considered to remedy this impairment? Has progress been made in removing streams from the impaired list? Do trends in sedimentation/water quality, stream temperature, or flow warrant management actions to conserve and protect Rio Grande cutthroat, Rio Grande Chub, and Rio Grande Sucker? 	
		<ul style="list-style-type: none"> Number of impaired streams (303d) 	<ul style="list-style-type: none"> Colorado Department of Public Health and Environment Partnership Engagement 	2 years		
2, 4, 6	MQ11: What is the status of	<ul style="list-style-type: none"> Status of Rio Grande cutthroat trout, Rio 	<ul style="list-style-type: none"> Rio Grande cutthroat trout, 	All populations	<ul style="list-style-type: none"> Is the overall goal of the RGCT, RGS, and RGC 	DC-SCC-3

Monitoring Requirement	Monitoring Question	Indicator	Data Source and Responsibility	Frequency	Adaptive Management Questions	Associated Plan Component
	populations of fishes that are species of conservation concern?	Grande sucker, and Rio Grande chub conservation populations	Rio Grande sucker, and Rio Grande chub conservation team <ul style="list-style-type: none"> Partnership Engagement 	monitored every 5 years	Conservation Strategy (to provide for the long-term persistence of the species) being met?	
1	MQ12: Is the unit improving condition in priority watersheds?	<ul style="list-style-type: none"> Number of projects completed in priority watersheds Best management practices monitoring 	<ul style="list-style-type: none"> Forest Service Watershed Improvement Tracking (WIT) Monitoring protocols rating system Forest Service Watershed Condition Framework Classification and Assessment Tracking Tool (WCF-WCATT) 	2 years	Are watershed conditions improving in priority watersheds, or do additional management measures need to be considered to facilitate improvement?	DC-WA-1 OBJ-WA-1
2, 4	MQ13: What actions have been taken to restore riparian and wetland ecosystems?	<ul style="list-style-type: none"> Acres restored 	<ul style="list-style-type: none"> Partnership Engagement 	2 years	<ul style="list-style-type: none"> If multi-year declines in riparian/wetland vegetation are observed at the Forest level, what is causing them and are planning or management decisions needed to address them? 	DC-RMZ-1 OBJ-RMZ-1
3	MQ14: What is the status and trend of aquatic and riparian focal species	<ul style="list-style-type: none"> Beaver 	<ul style="list-style-type: none"> Forest Responsibility Number of HUC-12 watersheds with beaver activity 	2–4 years	Where other riparian and wetland ecosystem indicators suggest potential restoration needs, are beavers absent, and if so would beaver relocation be beneficial?	DC-RMZ-1 DC-WA-1

Goal 3

Actively contribute to social and economic sustainability in the broader landscape and connect citizens to the land

Monitoring questions and indicators of measure for Goal 3 are contained in Table 16.

Table 16. Forest plan-level monitoring questions and indicators of measure for Goal 3

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions	Associated Plan Components
7	MQ15: What are the economic contributions of the range, timber, recreation, and minerals programs, and how are they changing over time?	<ul style="list-style-type: none"> • Employment, income, and contribution to gross domestic product • Board feet of timber sold or harvested • Acres treated 	<ul style="list-style-type: none"> • Forest Service IMPLAN model • Forest Service Timber Information Manager (TIM) • Forest Service Activity Tracking System (FACTS) • Forest responsibility 	2 years	<ul style="list-style-type: none"> • Does the Forest continue to provide sufficient economic benefits to different communities through various program areas? If not, are there programmatic changes that could be considered? 	OBJ-VEG-3 OBJ-VEG-4 OBJ-VEG-5
2, 7	MQ16: What are the economic contributions of the wildlife and fisheries program to the local economy and how are they changing over time?	<ul style="list-style-type: none"> • Number of recreational user/activity days related to hunting, fishing, and wildlife viewing, and economic contribution to local counties 	<ul style="list-style-type: none"> • Colorado Parks and Wildlife annual data 	2 years	<ul style="list-style-type: none"> • How do fish and wildlife values contribute to the recreational pursuits of various communities in the San Luis Valley and what are the benefits of these programs to agency goals such as Kids in the Woods, and helping to get people outside? 	DC-FISH-1 DC-REC-1
		<ul style="list-style-type: none"> • Number of special events hosted such as Free Fishing Day, Migratory Bird Day, etc. • Number of viewing sites developed or 	<ul style="list-style-type: none"> • Internal Forest Service staff data 			

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions	Associated Plan Components
		maintained				
2, 7	MQ17: What is the status and trend of rangeland health?	<ul style="list-style-type: none"> Range condition Changes in number of allotments with active grazing Number of surveyed allotments not meeting, moving toward, or meeting desired conditions Acres of upland restored 	<ul style="list-style-type: none"> NRIS/ Forest Service Activity Tracking System (FACTS) Forest responsibility 	4-6 years		DC-RNG-1 DC-RNG-2 DC-RNG-3 DC-RNG-4 DC-NNIS-1 DC-NNIS2
		<ul style="list-style-type: none"> Presence and extent of nonnative invasive species and noxious weeds Acres noxious weeds treated 	<ul style="list-style-type: none"> Forest Service Nonnative Invasive Species (NNIS) Forest responsibility 	2 years		
5	MQ18: What is the status and trend of roads and trails?	<ul style="list-style-type: none"> Miles of roads and trails open year-round or open seasonally Miles of roads and trails built and decommissioned Miles of roads and trails maintained by maintenance level Miles of roads and trails maintained or improved to standard 	<ul style="list-style-type: none"> Forest Service Infrastructure database (INFRA) Forest responsibility 	2 years		DC-REC-1
		<ul style="list-style-type: none"> Use of roads and trails 	<ul style="list-style-type: none"> National Visitor Use Monitoring Forest responsibility 	5 years		
5	MQ19: What	<ul style="list-style-type: none"> Visitation on the 	<ul style="list-style-type: none"> National Visitor 	5 years	<ul style="list-style-type: none"> If and where trends in 	DC-REC-1

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions	Associated Plan Components
	recreational activities are the public participating in, and what is their current satisfaction level?	<p>Forest</p> <ul style="list-style-type: none"> Changes in demand/participation in new activities Percent satisfaction for: <ol style="list-style-type: none"> Very satisfied Somewhat satisfied Total satisfaction 	<p>Use Monitoring</p> <ul style="list-style-type: none"> Forest responsibility 		<p>recreational satisfaction and use are increasing or decreasing?</p> <ul style="list-style-type: none"> What factors or trends are leading to this change? What changes could be made to improve current and future visitor satisfaction? How is the public contributing to the local community? Where are people coming from to use the Forest? 	DC-INFR-1
7	MQ20: Is the Forest preserving, protecting, and/or restoring cultural resources, including traditional cultural properties and landscapes?	<ul style="list-style-type: none"> Number of areas of tribal importance, cultural resources and properties identified, preserved, protected, or restored 	<ul style="list-style-type: none"> Heritage Program Managed to Standard (HPMtS) Forest responsibility 	Monitoring of 25 percent of Priority Heritage Assets (PHA) each year. All PHAs monitored at least once every 5 years		DC-DR-1 DC-ATI-1
7	MQ21: How is the Forest engaging visitors, local communities, tribes, and partners to achieve desired conditions, goals, and objectives (i.e., through outreach, education,	<ul style="list-style-type: none"> Number and type of outreach, education, consultation, collaboration, and volunteer activities 	<ul style="list-style-type: none"> Heritage Program Managed to Standard (HPMtS) particularly Indicator 2, 3 and 5. Forest responsibility Forest Service NatureWatch, 	Annually		DC-CR-1 DC-ATI-1 DC-ATI-2 DC-ATI-3

Monitoring Requirement	Monitoring Question	Indicator	Data Source	Frequency	Sample Adaptive Management Questions	Associated Plan Components
	consultation, and collaboration)?		<p>Interpretation and Conservation Education (NICE) reports</p> <ul style="list-style-type: none"> • Partner engagement 			
2, 7	MQ22: What management activities are being implemented to reduce the threat of wildland fire to real property and infrastructure and restore forest ecosystems?	<ul style="list-style-type: none"> • Acres and location of fuel management and restoration treatments (mechanical and prescribed fire) 	<ul style="list-style-type: none"> • Forest Service Activity Tracking System (FACTS) • Forest responsibility 	2 years		DC-FIRE-1 OBJ-VEG-1 OBJ-VEG-2 OBJ-VEG-7
	MQ23: What are the conditions and trends of visibility and air quality/ deposition in selected Class II areas on the unit?	<ul style="list-style-type: none"> • Visibility • Nitrates and sulfate deposition 	<ul style="list-style-type: none"> • IMPROVE (Interagency Monitoring of Protective Visual Environments) • U.S. Geological Survey • National Atmospheric Deposition Program (NADP) • Partnership Engagement 	2 years		DC-AIR-1

Adaptive Management

The adaptive management process implements plan direction, analyzes the impacts, monitors, and then evaluates adjustments that may be necessary in a timely manner. Changes will be incorporated through interdisciplinary analysis and will include public involvement.

To be more responsive to necessary changes in forest plan content, Forest staff will annually post proposed changes and the rationale for the changes, which could include monitoring results, on the Forest website. In conjunction with release of the changes, a stakeholder meeting would be held to discuss the changes proposed in detail followed by a comment period. Upon receiving and reviewing all comments, the responsible official would determine the proper authority to be used in making necessary changes to the forest plan content.

Changes to plan components require a forest plan amendment that could use any of the approved authorities available at the time. Changes to optional plan content, corrections in clerical errors to any content (including plan components), changes needed to conform to new statutory or regulatory requirements for which there is no discretion, and other changes to plan content, excluding changes to the substance of plan components or to the application of plan components to specific areas, may be adjusted through an administrative change. This would be done in compliance with the 2012 Planning Rule (36 CFR 219.7(f)) and Forest Service direction from Forest Service Handbook 1909.12 § 21.5.

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Glossary

A

Access

Road or trail route over which a public agency claims a right-of-way for public use; a way of approach.

Adaptive management

An approach to natural resource management where actions are designed and executed and effects are monitored for the purpose of learning and adjusting future management actions, which improves the efficiency and responsiveness of management.

Age class

Age class is one of the intervals, commonly 10 years, into which the age range of trees is divided for classification or use. Age class distribution refers to the location and/or proportionate representation of different age classes in a forest.

Air quality: Class I, II, and III areas

The area classification scheme established by Congress to facilitate implementation of the prevention of significant deterioration of the air quality provisions of the Clean Air Act.

Class I areas receive the highest degree of protection, with only a small amount of certain kinds of additional air pollution allowed.

Mandatory Class I areas were designated by Congress and include international parks, national wilderness areas or national memorial parks larger than 5,000 acres, or national parks larger than 6,000 acres, that were in existence (or authorized) on August 7, 1977. The 1990 amendments to the Clean Air Act specified that acreage added to these areas after 1977 must also receive Class I designation. Mandatory Class I areas may not be redesignated to any other classification.

Congress initially designated all other attainment areas as **Class II** and allowed a moderate increase in certain air pollutants.

No **Class III areas**, where a large amount of new air pollution would be allowed, were designated by Congress, but a process was established for redesignating Class II areas to the more protective Class I or the less protective Class III status. Only states or Native American governing bodies have authority to redesignate these areas, except as noted above.

Air quality related values

Resource that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource. Values are specific for each designated wilderness area.

Assessment

For the purposes of land management planning at 36 CFR 219, an assessment is the identification and evaluation of existing information to support land management planning. Assessments are not decision-making documents, but provide current information on select topics relevant to the plan area in the context of their borders.

At-risk species

A term used to collectively refer to the federally recognized threatened, endangered, proposed, and candidate species and species of conservation concern within the planning area.

Aquatic ecosystem

The stream channel, lake or estuary bed, water, biotic communities, and the habitat features that occur therein.

B

Basal area

The cross-sectional area, in square feet, of a tree measured at breast height (4.5 feet). Basal area of an area is generally estimated in terms of square feet per acre.

Best management practices

Methods or techniques that have been determined to be the most effective and practical means of achieving an objective while making the optimum use of resources.

Big game

Those species of large mammals normally managed for sport hunting, generally including antelope, bighorn sheep, deer, elk, moose, and mountain goat.

Big game winter range

Big game winter range is where a population or portion of a population of animals uses the documented suitable habitat within this range annually, in substantial numbers only during the winter. Crucial winter range describes any portion of the range which has been documented as the determining factor in a population's ability to maintain itself at a certain level over the long term.

Biological diversity, or biodiversity

The full variety of life in an area, including the ecosystem, plant, and animal communities, species and genes, and the processes through which individual organisms interact with one another and with their environment.

Biotic

Typically refers to living organisms in their ecological rather than their physiological relations.

Browse

The buds, shoots, and leaves of woody plants eaten by livestock or wild animals.

C

Canada lynx

The Canada lynx (*Lynx canadensis*) is a North American mammal of the cat family, Felidae, which ranges across Canada and into Alaska as well as some parts of the northern United States, including Colorado.

Candidate species

For species under the purview of the U.S. Fish and Wildlife Service (Service), a species for which the Service possesses sufficient information on vulnerability and threat to support a proposal to list as endangered or threatened, but for which no proposed rule has yet been published.

Canopy

The uppermost spreading, branchy layer of a forest.

Canopy cover

The proportion or percentage of the forest floor covered by the vertical projection of tree crowns.

Channel

A passage, either naturally or artificially created, that periodically or continuously contains moving water, or that forms a connecting link between two bodies of water. River, creek, run, branch, and tributary are some of the terms used to describe natural channels, which may be single or braided. Canal and floodway are some of the terms used to describe artificial channels.

Clearcut

1. A stand in which essentially all trees have been removed in one operation to produce an even-aged stand. Depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration (see regeneration method two-aged methods).
2. A regeneration or harvest method that removes essentially all trees in a stand. A minor live component of the stand may be retained for purposes other than regeneration. The retained trees, referred to as leave trees, should generally comprise less than 10 percent of the growing space of the stand.

Climax

The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition.

Clone

A group of plants (for example, aspen) growing in close association, derived by asexual reproduction from a single parent plant.

Coarse woody debris

Provides living spaces for a host of organisms and serves as long-term storage sites for moisture, nutrients, and energy. Coarse woody debris consists of any woody material greater than 3 inches in diameter and is derived from tree limbs, boles, roots, and large wood fragments and fallen trees in various stages of decay.

Code of Federal Regulations

The listing of various regulations pertaining to management and administration of national forests and other Federal lands.

Collaboration

Working with someone to produce or create something.

Commercial thinning

An intermediate harvest of commercial-sized trees to meet a variety of management objectives including reducing stand density to improve tree growth, improving forest health, or to meet other stand structural or composition objectives.

Confluence

The point where two streams meet.

Connectivity

Ecological conditions that exist at several spatial and temporal scales that provide landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long distance range shifts of species, such as in response to fluctuations in climate.

Conservation strategy

A conservation strategy is a management scheme or plan to conserve or sustain particular ecosystem elements such as rare species or habitats. An example of a conservation strategy is to survey for potential habitats during project planning in order to protect known populations of a rare species through project-specific measures.

Constraint

A qualification of the minimum or maximum amount of an output or cost that could be produced or incurred in a given time period.

Construction

The displacement of vegetation, soil, rock, and the installation of human-made structures involved in the process of building a complete, permanent road facility. The activities occur at a location or corridor that is not currently occupied by a road.

Coppice (Coppice with standards)

Coppice is a vegetation reproduction method with clear felling or clearcutting. Clear felling stimulates sprouting from the residual roots. Standards are selected overstory trees reserved for a longer rotation at the time each crop of coppice material is cut.

Corridor (utility or right-of-way)

A linear strip of land defined for the present or future location of transportation or utility right-of-way within its boundaries.

Council on Environmental Quality

An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews Federal programs for their effects on the environment, conducts environmental studies, and advises the President on environmental matters.

Cover type

The dominant vegetation in an area—for example, aspen, ponderosa pine, or sedges.

Critical habitat

For a threatened or endangered species, (1) the specific areas within the geographical area occupied by the species, at the time it is listed under the Endangered Species Act, on which are found those physical or biological features (a) essential to the conservation of the species, and

(b) which may require species management considerations or protection; and (2) specific areas outside of the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such area are essential for the conservation of the species. Critical habitat is designated through rule making by the Secretary of the Interior or Commerce.

Crown

The upper part of a tree or other woody plant carrying the main branch system and foliage.

Culmination of mean annual increment

Mean annual increment of growth and culmination of mean annual increment of growth. Mean annual increment of growth is the total increment of increase of volume of a stand (standing crop plus thinnings) up to a given age divided by that age. Culmination of mean annual increment of growth is the age in the growth cycle of an even-aged stand at which the average annual rate of increase of volume is at a maximum. In land management plans, mean annual increment is expressed in cubic measure and is based on the expected growth of stands, according to intensities and utilization guidelines in the plan.

Cultural landscapes

Cultural resources that represent the combined works of nature and humans.

Cultural resources

An object or definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence. Cultural resources are prehistoric, historic, archaeological, or architectural sites, structures, places, or objects and traditional cultural properties. Cultural resources include the entire spectrum of resources for which the Heritage Program is responsible, from artifacts to cultural landscapes, without regard to eligibility for listing on the National Register of Historic Places.

D

Decadence

A process, condition, or period of deterioration or decline.

Deciduous

A deciduous tree or shrub sheds its leaves annually.

Decommission

Demolition, dismantling, removal, obliteration, and/or disposal of a deteriorated or otherwise unneeded asset or component, including necessary cleanup work. This action eliminates the deferred maintenance needs for the fixed asset. Decommissioning roads includes activities that result in the stabilization and restoration of unneeded roads to a more natural state.

Designated road, trail, or area

A National Forest System road or trail, or an area of National Forest System lands, that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map (36 CFR 212.1).

Designated wilderness

Designated wilderness refers to any area of land designated by Congress as part of the National Wilderness Preservation System that was established by the Wilderness Act of 1964.

Desired condition

A description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. (36 CFR 219.7(e)(1)(i))

Developed recreation

Recreation that occurs at man-made developments such as campgrounds, picnic grounds, resorts, ski areas, trailheads, etc. Facilities might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. Campgrounds and picnic areas are examples of developed recreation sites.

Developed site

Developed recreation sites are relatively small, distinctly defined areas where facilities are provided for concentrated public use, such as campgrounds and picnic areas.

Diameter at breast height (dbh)

The diameter of a standing tree measured at a point 4 feet 6 inches from ground level on the uphill side.

Dispersed recreation

Outdoor recreation that is spread out over the land and in conjunction with roads, trails, and undeveloped waterways. Activities are typically day-use oriented and include hunting, fishing, boating, hiking, off-road vehicle use, cross-country skiing, motorbiking, and mountain climbing.

Disturbance

Any relatively discrete event in time that disrupts ecosystem, watershed, community, or species population structure and/or function and changes resources, substrate availability, or the physical environment.

Diversity

The distribution and abundance of different plant and animal communities and species within an area. This term is not synonymous with “biological diversity.”

Down or downed

A tree or portion of a tree that is dead and lying on the ground.

Downed woody material or debris

Woody material, from any source, that is dead and lying on the forest floor.

E

Easement

A right afforded a person or agency to make limited use of another’s real property for access or other purposes.

Ecological conditions

The biological and physical environment that can affect the diversity of plant and animal communities, the persistence of native species, and the productive capacity of ecological systems. Ecological conditions include habitat and other influences on species and the

environment. Examples of ecological conditions include the abundance and distribution of aquatic and terrestrial habitats, connectivity, roads, and other structural developments, human uses, and invasive species.

Ecological integrity

The quality or condition of an ecosystem when its dominant ecological characteristics (for example, composition, structure, function, connectivity, and species composition and diversity) occur within the natural range of variation and can withstand and recover from most perturbations imposed by natural environmental dynamics or human influences.

Ecological process

The actions or events that link organisms (including humans) and their environment, such as disturbance, successional development, nutrient cycling, carbon sequestration, productivity, and decay.

Ecological sustainability

The capability of ecosystems to maintain ecological integrity.

Economic sustainability

The capability of society to produce and consume or otherwise benefit from goods and services, including contributions to jobs and market and nonmarket benefits.

Ecosystem

A spatially explicit, relatively homogenous unit of the Earth that includes all interacting organisms and elements of the abiotic environment within its boundaries. Usually described in terms of its composition, structure, function, and connectivity.

Ecosystem services

The direct and indirect contributions of ecosystems to human well-being. They directly or indirectly support survival and quality of life. Ecosystem services can be categorized into types:

Provisioning services – products obtained from ecosystems such as food, fresh water, wood, fiber, genetic resources, and medicines.

Regulating services – benefits obtained from the regulation of ecosystem processes such as climate and natural hazards, water purification, waste management, pollination, and pest control.

Cultural services – nonmaterial benefits that people obtain from ecosystems such as spiritual enrichment, intellectual development, recreation, and aesthetic values.

Supporting services – ecosystem services that are necessary for the production of all other ecosystem services. Examples include biomass production, production of atmospheric oxygen, soil formation and retention, nutrient cycling, water cycling, and provisioning of habitat.

Edaphic

Of, produced by, or influenced by the soil; related or caused by particular soil conditions, as of texture or drainage, rather than by physiographic or climatic factors.

Edge

The place where plant communities meet or where successional stages or vegetative conditions within plant communities come together.

Endangered species

Any species that the Secretary of Interior or the Secretary of Commerce has determined is in danger of extinction throughout all or a significant portion of its range.

Endangered Species Act

Public Law 93-205, approved in 1973 and since amended, the Endangered Species Act provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend.

Environmental Impact Statement

A formal public document prepared to analyze the impacts on the environment of a proposed project or action and released for comment and review. It is prepared first in draft or review form and later in final form. An EIS must meet the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) guidelines, and directives of the agency responsible for the proposed project. An impact statement includes the following points: 1) the environmental impact of the proposed action, 2) any adverse impacts that cannot be avoided by the action, 3) the alternative courses of actions, 4) the relationships between local short-term use of the human environment and the maintenance and enhancement of long-term productivity, and 5) a description of the irreversible and irretrievable commitment of resources, which would occur if the action were accomplished.

Erosion

Detachment or movement of the land surface by water, wind, ice, gravity, or other geological activity. Accelerated erosion is much more rapid than normal, natural, geologic erosion, primarily as a result of the influence of activities of man, animals, or natural catastrophes.

Even-aged management

The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and therefore, tree sizes throughout the forested area). The difference in age between trees forming the main canopy level of a stand generally does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Clearcut, shelterwood, or seed-tree cutting methods produce even-aged stands (36 CFR 219.3).

Executive order

An order of regulation issued by the President or some administrative authority under his or her direction.

F

Facility

Structures needed to support the management, protection, and use of the national forests, including buildings, utility systems, dams, and other construction features. There are three types of facilities: recreation, administrative, and permittee.

Fen

An ancient wetland ecosystem dependent on nutrient-rich local or regional groundwater flow systems maintaining perennial soil saturation and supporting continuous organic soil (i.e., peat) accumulation. (FS-990A)

Fire management plan

A plan that identifies and integrates all wildland fire management and related activities within the context of approved land and resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans, including but not limited to preparedness plans, preplanned dispatch plans, prescribed fire burn plans, and prevention plans. Fire management plans assure that wildland fire management goals and components are coordinated.

Fire regime

Description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects as well, in a given area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes typically are described as cycles because some parts of the histories are repeated, and the repetitions can be counted and measured, such as fire return interval.

Fire regime condition class

Fire regime condition class is an expression of the departure of the current condition from the historical fire regime. It is derived from the historical fire regime and the current fire severity. It is used as a proxy for the probability of severe fire effects, e.g., the loss of key ecosystem components—soil, vegetation, structure—or alteration of key ecosystem processes—nutrient cycles, hydrologic regimes. The fire regime condition class is an index of ecosystem risks attributable to wildland fire.

Fire suppression

All the work and activities connected with fire-extinguishing operations, beginning with discovery and continuing until the fire is completely extinguished. The four fire suppression strategies are:

Monitor – the systematic process of observing, collecting, and recording fire-related data, particularly with regard to fuels, topography, weather, fire behavior, fire effects, smoke, and fire location. This may be done onsite, from a nearby or distant vantage point in person or using a sensor, or through remote sensing (aircraft or satellite).

Confine – to restrict a wildfire to a defined area by using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until out. This means that “some action is or has been taken” (line construction, bucket drops, etc.) to suppress portions of the fire perimeter.

Point zone protection – Point or zone protection involves protecting specific points from the fire while not actively trying to line the entire fire edge. Points being protected may be communities, individual homes, communication sites, areas of high resource value, etc.

Full suppression – a strategy to put the fire out as efficiently and effectively as possible, while providing for firefighter and public safety. To complete a fireline around a fire to halt fire spread, and cool down all hot spots that are an immediate threat to the control line or outside the perimeter, until the lines can reasonably be expected to hold under foreseeable conditions. Synonymous with “full perimeter containment” and “control.”

Floodplain

The flat area of land adjacent to a river channel that is composed of unconsolidated sediments (alluvium) deposited when the river overflows its banks at flood stages.

Focal species

A small subset of species whose status infers the integrity of the large ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area.

Forage

All browse and herbaceous foods that are available to grazing animals.

Forb

Any herbaceous flowering plant other than grasses.

Forest highway

A designated forest road under the jurisdiction of, and maintained by, a public authority that is subject to the Highway Safety Act.

Foreground

A term used in scenery management to describe the portions of a view between the observer and as far as one-quarter to one-half mile distant.

Forested land

Land at least 10 percent occupied by forest trees of any size, or forested having had such tree cover and not currently developed for nonforest use. Lands developed for nonforest use include areas for crops, improved pasture, residential or administrative areas, improved roads of any width, and adjoining road clearing and power line clearing of any width.

Forest health

The perceived condition of a forest derived from concerns about such factors as its age, structure, composition, function, and vigor, presence of unusual levels of insects and diseases, and resilience to disturbance.

Forest plan

Source of management direction for an individual national forest that specifies activity and output levels for a period of time. Management direction in the plan is based on the issues identified at the time of the plan's development.

Forest plan revision

The process for revising a forest plan includes preliminary identification of the need to change the plan based on the assessment, development of a proposed plan, consideration of the environmental effects of the proposal and preparation of a draft environmental impact statement, providing an opportunity for the public to comment on the proposed plan, providing an opportunity for the public to object before the proposal is approved, and finally, approval of the plan and preparation of the final environmental impact statement.

Fragmentation

A process that occurs wherever a large, contiguous habitat is transformed into smaller patches that are isolated from each other by a landscape matrix unlike the original. This matrix can differ

from the original habitat in either composition or structure. The crucial point is that it functions as either a partial or total barrier to dispersal for species associated with the original habitat. A clear threat to population persistence occurs when fragmentation isolates pairs and populations, as opposed to fragmentation within the home range of individual pairs.

Fuel

Organic material that will support the start and spread of a fire: duff, litter, grass, weeds, forbs, brush, trees, and dead wood materials.

Fuel load

The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available (consumable) fuel or total fuel and is typically dry weight.

Fuels management

The manipulation of vegetation for the purpose of changing the characteristics of a fire as it burns.

Fuels reduction treatment

Manipulation or removal of fuels to lessen potential damage and resistance to control (includes mechanical and prescribed fire treatments). Fuels reduction treatments result in a change in the amount, configuration, and spacing of live and dead vegetation, with the purpose of creating conditions that result in more manageable fire behavior and reduced severity during wildfires.

Fuelwood

Round, split, or sawed wood of general refuse material, which is cut into short lengths for burning as fuel.

Functioning watershed

A watershed that is functioning properly has five important characteristics (Williams et al. 1997):

1. They provide for high biotic integrity, which includes habitats that support adaptive animal and plant communities that reflect natural processes.
2. They are resilient and recover rapidly from natural and human disturbances.
3. They exhibit a high degree of connectivity longitudinally along the stream, laterally across the floodplain and valley bottom, and vertically between surface and subsurface flows.
4. They provide important ecosystem services, such as high-quality water, the recharge of streams and aquifers, the maintenance of riparian communities, and the moderation of climate variability and change.
5. They maintain long-term soil productivity.

(From FS 977, Watershed Condition Framework, May 2011)

G**Game species**

Any species of wildlife or fish for which hunting seasons and bag limits have been established, and are normally harvested by hunters and fishermen.

Geographic information system

An information processing technology to input, store, manipulate, analyze, and display spatial resource data to support the decision-making processes of an organization. Generally, an electronic medium for processing map information.

Goal

A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms, and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed. (36 CFR 219.3)

Grass/forb

An early forest successional stage during which grasses and forbs are the dominant vegetation.

Groundwater

Water within the earth that supplies wells and springs. Specifically, water in the zone of saturation where all openings in soil and rock are filled. The upper surface level forms the water table.

Group selection

A method of regenerating uneven-aged stands in which trees are cut, in small groups, and new age classes are established. The width of groups is commonly approximately twice the height of the mature trees, with small openings providing suitable microclimates for shade-tolerant tree species to regenerate, and the larger openings providing suitable microclimates for more shade-intolerant tree species to regenerate.

Guideline

A constraint on project or activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are intended to help achieve or maintain a desired condition or conditions, avoid or mitigate undesirable effects, or meet applicable legal requirements.

H

Habitat

The natural environment of a plant or animal. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Herbaceous

Of, denoting, or relating to herbs.

Heritage resources

Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values.

Hibernacula

Habitat niches where certain animals, e.g., bats, over-winter, such as caves, mines, tree hollows, or loose bark.

Hydrologic unit code

A sequence of numbers that identifies a hydrologic unit (such as rivers, river reaches, lakes, or drainage basins) which are nested drainage basins or watersheds.

I

Ignition

The initiation of combustion.

IMPLAN

Acronym for the computer model used as an analysis tool to display social effects of various alternatives developed during the land management planning effort.

INFRA

INFRA is a collection of web-based data entry forms, reporting tools, and GIS tools that enable the Forest Service to manage and report accurate information about the inventory of constructed features and land units as well as the permits sold to the public and to partners.

Infrastructure

The facilities, utilities, and transportation system needed to meet public and administrative needs for operation, e.g., buildings, roads, and power supplies.

Inholding

Land within the proclaimed boundaries of a national forest that is owned by a private citizen, an organization, or an agency.

Instream flow

The volume of surface water in a stream system passing a given point at a given time.

Interdisciplinary team

A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately solve the problem.

Intermittent stream

A stream or reach of stream channel that flows, in its natural condition, only during certain times of the year or in several years. Characterized by interspersed, permanent surface water areas containing aquatic flora and fauna adapted to the relatively harsh environmental conditions found in these types of environments (Briggs 1996).

Interpretation

Explaining the meaning or significance of something.

Invasive species

Native species are those that have occurred, now occur, or may occur in a given area as a result of natural processes.

Exotic (a.k.a. nonnative, foreign, or alien) species are those that live outside their native range and arrived there by human activity, either deliberate or accidental.

Invasive species have the ability to thrive and spread aggressively outside their natural range. They affect both aquatic and terrestrial areas and can be plants, vertebrates, invertebrates, and pathogens.

Invertebrate

An animal lacking a spinal column.

L

Land exchange

The conveyance of non-Federal land or interests to the United States in exchange for National Forest System land or interests in land.

Landscape

A defined area irrespective of ownership or other artificial boundaries, such as a spatial mosaic of terrestrial and aquatic ecosystems, landforms, and plant communities, repeated in similar form throughout such a defined area.

Landscape scale

A heterogeneous land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout. Landscapes vary in size, from many thousands of acres to only a few kilometers in diameter.

Landslide

The moderately rapid to rapid downslope movement of soil and rock that may or may not be water-saturated.

Late-successional forest

A stage of forest succession where the majority of trees are mature or overmature.

Large woody debris

Large pieces of relatively stable woody material located within the bankfull channel and appearing to influence bankfull flows.

Single – A single piece that has a length equal to or greater than 3 meters or two-thirds of the wetted stream width and 10 centimeters in diameter one-third of the way from the base.

Aggregate – Two or more clumped pieces, each of which qualifies as a single piece.

Rootwad – Rootmass or boles attached to a log less than 3 meters in length.

Leasable minerals

Those minerals or materials designated as leasable under the Minerals Leasing Act of 1920. They include coal, phosphate, asphalt, sulfur, potassium, sodium minerals, and oil and gas. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

Lease

A legal contract that provides for the right to develop and produce oil and gas resources for a specific period of time under certain agreed-upon terms and conditions.

Leave tree

A tree marked to be left standing in an area where it would otherwise be felled.

Litter

A surface layer of loose organic debris, consisting of freshly fallen or slightly decomposed organic materials.

Locatable minerals

Minerals or materials subject to claim and development under the Mining Law of 1872, as amended. Generally includes metallic minerals such as gold and silver, and other materials not subject to lease or sale, like some bentonites, limestone, talc, some zeolites, etc.

Lynx analysis unit

An area of at least the size used by an individual lynx, from about 25 to 50 square miles.

M

M

1,000 units (thousands)

Maintenance

The upkeep of the entire Forest Development Transportation Facility, including surfaces and shoulders, parking and side areas, structures, and such traffic control devices as are necessary for its safe and efficient use (36 CFR 212.1). Maintenance is not for the purpose of upgrading a facility, but to bring it to the originally constructed or subsequently reconstructed conditions.

Maintenance level

The level of service provided by, and maintenance required for, a specific road. For more information, see the entry for **road maintenance level**.

Management action or activity

An action or activity humans impose on a landscape for the purpose of managing natural resources.

Management approach

Management approaches describe the principal strategies and program priorities the responsible official intends to employ to carry out projects and activities developed under the plan. They can convey a sense of priority and focus among objectives and likely management emphasis. They are optional plan content.

Management area

A land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous.

Management concern

An issue, problem, or a condition that constrains the range of management practices identified by the Forest Service in the planning process. (36 CFR 219.3)

Management direction

A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them. (36 CFR 219.3)

Management prescription

Management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives. (36 CFR 219.3)

Mass movement

Downslope unit movement of a portion of the land surface. A single landslide of the gradual, simultaneous downhill movement of the entire mass of loose earth material on a slope face.

MBF

One thousand board feet of timber.

Mechanical treatment

Mechanical vegetation treatment is any activity undertaken to modify the existing condition of the vegetation accomplished with mechanical equipment.

Mechanized

Provided with mechanical power.

Mechanized transport

Includes wheeled forms of transportation such as nonmotorized carts, wheelbarrows, bicycles, and any other nonmotorized, wheeled vehicles.

Memorandum of understanding

A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A memorandum of understanding is not a fund-obligating document.

Metapopulation

A group of populations separated by space but that consist of the same species. These spatially separated populations interact as individual members move from one population to another.

Mineral

Locatable – Hard rock minerals that are mined and processed for the recovery of metals. They may include certain nonmetallic minerals and uncommon varieties of mineral materials such as valuable and distinctive deposits of limestone or silica.

Leasable – Coal, oil, gas, phosphate, sodium, potassium, oil shale, sulfur, and geothermal resources.

Salable (or mineral materials) – A collective term to describe common varieties of sand, gravel, stone, pumice, cinders, clay, and other similar materials. Common varieties do not include deposits of those materials that may be locatable. In general, these minerals are widely spread and are relatively low in unit value. They are generally used for construction materials and for road building purposes.

Mineral entry

Claiming public lands administered by the Forest Service under the Mining Law of 1872 for the purpose of exploiting minerals. May also refer to mineral exploration and development under the mineral leasing laws and Material Sale Act of 1947.

Mineral withdrawal

The exclusion of locatable mineral deposits from mineral entry on areas required for administrative sites by the Forest Service, and other areas highly valued by the public. Public lands withdrawn from entry under the General Mining Laws and/or the Mineral Leasing Laws.

Minimum stocking standard

The stocking that must be present on regenerated areas before a new stand can be considered established. Minimum stocking is generally stated in terms of number of trees per acre and tree-stem heights by species.

Mining

Extraction of valuable minerals or other geological materials from the earth.

Mitigate, or mitigation

To avoid, minimize, rectify, reduce, or compensate the adverse environmental impacts associated with an action.

Modification

A description in scenic quality objectives when activities may dominate, but must use naturally established form, color, and texture. These areas should appear natural when viewed in the background.

Monitoring

A systematic process of collecting information to evaluate effects of actions or changes in conditions or relationships.

Montane

Of or inhabiting mountainous country.

Mosaic

The intermingling of plant communities and their successional stages in such a manner as to give the impression of an interwoven design.

Motorized vehicle

Any vehicle which is self-propelled, other than: a) a vehicle operated on trails; and b) any wheelchair or mobility device, including one that is battery-powered, that is designed solely for use by a mobility-impaired person for locomotion and that is suitable for an indoor pedestrian areas (36 CFR 212.1).

Motorized equipment

A machine that uses a motor, engine, or other nonliving power source. This includes, but is not limited to, machines such as chain saws, aircraft, snowmobiles, generators, motorboats, and motor vehicles. It does not include small battery or gas powered hand carried devices such as shavers, wristwatches, flashlights, cameras, stoves, or other similar small equipment.

Motorized route

A National Forest System road or trail that is designated for motorized use on a motor vehicle use map pursuant to 36 CFR 212.51.

Motorized use

The designation of roads, trails, and areas that are open to motor vehicle use as specified in the Federal Register / Vol. 70, No. 216 / Wednesday, November 9, 2005 / 36 CFR Parts 212, 251, 261, Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule.

Motor vehicle use map

A map reflecting designated roads, trails, and areas open to motorized public use on an administrative unit or a ranger district of the National Forest System.

Multiple use

The management of all the various renewable surface resources of the national forests so that they are used in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in the use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output. (36 CFR 219.19)

N

National Environmental Policy Act (NEPA)

A 1969 act declaring a national policy that encourages productive and enjoyable harmony between humankind and the environment, to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality. (The Principal Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USDA, Forest Service, 359 pp.) The NEPA process is an interdisciplinary process that concentrates decision-making around issues, concerns, alternatives, and the effects of alternatives on the environment. NEPA regulations are set out in Forest Service Handbook 1909.15.

National Forest Management Act

A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of regional guides and forest plans, and the preparation of regulations to guide that development.

National Forest System lands

All national forest lands reserved or withdrawn from the public domain of the United States, all national forest lands acquired through purchase, exchange, donation, or other means, the national grasslands and land utilization projects administered under title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 USC 1010-1012), and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system. 16 USC 1609(a).

National Historic Preservation Act

Extends the policy in the Historic Sites Act to State and local historical sites as well as those of national significance, expands the National Register of Historic Places, establishes the Advisory Council on Historic Preservation and the State Historic Preservation Officers, and requires agencies to designate Federal Preservation Officers. Section 106 directs all Federal agencies to take into account the effects of their undertakings (actions, financial support, and authorizations) on historic properties included in or eligible for the National Register. Section 110 establishes inventory, nomination, protection, and preservation responsibilities for federally owned historic properties.

National Register of Historic Places

The Nation's official list of cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, the National Register is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archaeological resources. Properties listed in the Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The National Register is administered by the National Park Service.

Native American Graves Protection and Repatriation Act (NAGPRA)

Provides a process for museums and Federal agencies to return certain Native American cultural items—human remains, funerary objects, sacred objects, or objects of cultural patrimony—to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional excavation, and unanticipated discovery of Native American cultural items on Federal and Tribal lands, and penalties for noncompliance and illegal trafficking. The Act requires agencies and museums to identify holdings of such remains and objects and to work with appropriate Native American groups toward their repatriation. Permits for the excavation and/or removal of “cultural items” protected by the Act require Tribal consultation, as do discoveries of “cultural items” made during activities on Federal or Tribal lands.

Natural range of variation

The variation of ecological characteristics and processes over scales of time and space that are appropriate for a given management application. In contrast to the generality of historical ecology, the natural range of variation concept focuses on a distilled subset of past ecological knowledge developed for use by resource managers; it represents an elicited effort to incorporate a past perspective into management and conservation decisions. The pre-European influenced reference period considered should be sufficiently long, often several centuries', to include the full range of variation produced by dominant natural disturbance regimes such as fire and flooding and should also include short-term variation and cycles in climate. The natural range of variation is a tool for assessing the ecological integrity and does not necessarily constitute a management target or desired condition. The natural range of variation can help identify key structural, functional, compositional, and connectivity characteristics, for which plan components may be important for either maintenance or restoration of such ecological conditions.

Nonmotorized activities

Activities that do not incorporate the use of a motor, engine, or other nonliving power source. This includes such machines as aircraft, hovercraft, motorboats, automobiles, motor bikes, snowmobiles, bulldozers, chainsaws, rock drills, and generators.

Notice of intent

Written notice to announce the Forest Service's intent to begin forest plan revision and prepare an environmental impact statement.

O

Objective

A concise, measureable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives should be based on reasonable foreseeable budgets.

Old forest

The overstory is dominated by late seral or climax species of a certain age and size, and has other characteristics such as snags, canopy layers, downed woody material, and trees with rotten, dead, or broken tops.

Openings

Meadows, clearcuts, and other areas of vegetation that do not provide cover.

Oshá

Oshá, also known as osha (*Ligusticum porteri*), is a perennial herb found in parts of the Rocky Mountains and northern Mexico, especially in the southwestern United States. Oshá is strictly a mountain plant that requires partial shade. It is most commonly found in deep, moist soils rich in organic material.

Outputs

The goods, end products, or services that are purchased, consumed, or used directly by people. Goods, services, products, and concerns produced by activities that are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives.

Overstory

That portion of a plant community consisting of the taller plants on the site; the forest or woodland canopy.

Over-the-snow vehicle

Vehicles that are designed for use over snow and that run on a track or tracks and/or a ski or skis, while in use over snow.

P

Party

A group of people readily recognized as traveling together.

Perennial stream

A stream or reach of a channel that flows continuously or nearly so throughout the year and whose upper surface is generally lower than the top of the zone of saturation in areas adjacent to the stream.

Persons at one time (PAOT)

A recreational capacity measurement term indicating the number of people who can use a facility or area at one time. Equal to five persons per family unit for camp and picnic grounds.

Planned ignition

The intentional initiation of a wildland fire by a hand-held, mechanical, or aerial device where the distance and timing between ignition lines or points and the sequence of igniting them is determined by environmental conditions (weather, fuel, topography), firing technique, and other factors that influence fire behavior and fire effects (see prescribed fire).

Planning period

The lifetime of the plan. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects, and benefits.

Planning Rule

The 2012 Planning Rule provides the overarching framework for individual forests and grasslands in the National Forest System to use in developing, amending, and revising land management plans, which are also known as forest plans. The planning rule identifies a framework for revising land management plans that consists of three phases: assessment, plan revision, and monitoring.

The Forest Service is required by statute to have a national planning rule: the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976, requires the Secretary of Agriculture to issue regulations under the principles of the Multiple-Use Sustained-Yield Act of 1960 for the development and revision of land management plans.

Planning unit

The area planned for treatment as identified in a project-level decision document.

Plant community

Any assemblage of plants that occur in the same area and form a distinct ecological unit.

Pole or pole timber

Smaller diameter trees larger than saplings that do not meet the specifications for sawtimber.

Pre-commercial thinning

Cutting non-sawtimber trees to meet a variety of management objectives including improving tree vigor, stand species composition, wildlife habitat, or reducing fuels.

Prescribed fire

Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and National Environmental Policy Act requirements must be met, prior to ignition (see planned ignition).

Prescription

Management practices selected and scheduled for application on a specific area to attain goals and objectives.

Preservation

A scenic condition objective in which only ecological changes are allowed. Management activities, except for low impact recreation facilities, are prohibited. This objective applies mainly to wilderness, primitive areas, and areas with special classifications.

Also, a technique of conservation that maintains the resource in or on the ground into perpetuity.

Priority heritage asset

A historic property that meets the criteria for a priority heritage asset with a current documented condition assessment and a recommended management use that realizes its agency and public benefit(s).

Productive

The ability of an area to provide goods and services and sustain ecological values.

Project record

The documents and materials considered in the making of a forest plan, plan revision, or plan amendment. Also known as the planning record.

Proposed action

In terms of the National Environmental Policy Act (NEPA), the project, activity, or decision that a Federal agency intends to implement or undertake, which is the subject of an environmental impact statement or environmental assessment.

Public access

Generally refers to a road or trail route over which a public agency claims right-of-way for public use.

Public participation

Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service planning.

Proposed species

Any species that is proposed by the U.S. Fish and Wildlife Service or National Marine Fisheries Service to be listed as threatened or endangered under the Endangered Species Act.

R

Range allotment

Rangelands are managed as allotments and pastures. An allotment is a designated area of land available for permitted livestock grazing. Grazing is authorized for a specified number and kind of livestock. It is the basic land unit used to facilitate management of the range resource on National Forest System lands administered by the Forest Service.

Range condition

The state of the plant community on a range site in relation to the potential natural community or the desired plant community for that site. It is typically rated in the general category of satisfactory or unsatisfactory.

Ranger district

Administrative subdivision of a national forest, supervised by a district ranger who reports to the forest supervisor.

Reclamation

Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Recreation opportunity spectrum (ROS)

Allocations that identify a variety of recreation experience opportunities categorized into six classes on a scale from primitive to urban. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs, based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use. The six classes are:

Primitive – Very high probability of experiencing solitude, self-reliance, and challenge; natural landscape with natural processes allowed to function; very low interaction between users; restrictions and controls not evident; access limited; generally cross-country travel.

Semi-primitive nonmotorized – Good probability of experiencing solitude, self-reliance, and challenges; natural primitive landscapes; some evidence of users; minimum subtle controls; access by low standard trails and cross-country travel; natural processes allowed to function with subtle vegetative alterations. Managed for nonmotorized use.

Semi-primitive motorized – Moderate probability for self-reliance and experiencing solitude away from roads and trails); risk associated with motorized equipment; predominantly natural landscapes; low concentration of users and interaction by users along roads and trails; minimum but subtle restrictions; vegetative alterations visually blend with the landscape. Existing routes are designated for off highway vehicles and other high clearance vehicles. Mountain bikes and other mechanized equipment are present.

Roaded natural – Low opportunity to avoid other users; little opportunity for risk or challenge; substantial modified landscapes; moderate evidence and interaction of users; controls and restrictions present; variety of motorized users and access; various shapes and sizes of vegetative alterations that blend with the landscape. The road system is well defined and can accommodate sedan travel.

Rural – Good opportunity to affiliate with others; facilities important; self-reliance of little importance; altered landscapes but attractive; high interaction among users; obvious and prevalent controls; extensive motorized use; vegetation maintained. Rural settings represent most developed recreation sites.

Urban – Opportunity to affiliate with others important; outdoor skills associated with competitive events; landscapes extensively changed with dominant structures; large numbers of user interactions; intensive controls are numerous; motorized use prevalent, including mass transit; vegetation planted and maintained. Highly developed ski areas and resorts are examples of a typical urban setting on National Forest lands.

Recreation setting

The social, managerial, and physical attributes of a place that, when combined, provide a distinct set of recreation opportunities. The Forest Service uses the recreation opportunity spectrum to define recreation settings and categorize them into six distinct classes: primitive, semi-primitive nonmotorized, semi-primitive motorized, roaded natural, rural, and urban.

Recreation site

A defined, public recreation area. The Forest Service uses two categories for recreation sites: dispersed and developed. Both types may have improvements needed to protect resources such as signs, road closure devices, bear resistant food storage devices, and/or sanitation facilities.

Some recreation sites are designed and managed for overnight use and some are designed and managed for day-use only (e.g., interpretive signs at roadside pull-outs, trailheads at roadside pull-outs or at road restrictions, picnic areas or boat launches that are closed at night, ski areas that do not have overnight lodging).

Developed sites have agency improvements made out of manmade materials that are intended to provide for public recreation and user comfort/convenience. Examples on National Forest Service lands include, but are not limited to: ski areas, campgrounds, sites with cabins, huts, lodges, recreation residences, visitor centers, and trailheads.

Dispersed sites have minimal to no agency improvements made out of manmade materials. Dispersed sites may include outfitter camps or other primitive camping spots along a road, trail, or water body, or at a road closure.

Reforestation

Management activities used to increase or accelerate the establishment of forest cover to meet resource objectives.

Regeneration

Natural – A group or stand of young trees created from germination of seeds from trees on the site or sprouting from trees on the site.

Artificial – A group or stand of young trees created by direct seeding or by planting seedlings or cuttings.

Regeneration harvest

Timber harvest system intended to create a new age class (see regeneration method).

Regeneration method

A cutting procedure by which a new age class is created. The major methods are clearcutting, seed-tree, shelterwood, selection, and coppice. Regeneration methods are grouped into four categories: coppice, even-aged, two-aged, and uneven-aged.

Rehabilitation

- 1) Actions taken to protect or enhance site productivity, water quality, or other values for a short period of time.
- 2) A short-term scenic condition objective used to restore landscapes containing undesirable visual or other resource impacts to the desired scenic or other acceptable quality level.

Research natural area (RNA)

Designated areas of land established by the Chief of the Forest Service under 36 CFR 251.23 for research and educational purposes and to typify important forest and range types of the Forest, as well as other plant communities that have special or unique characteristics of scientific interest and importance.

Resilience

The ability of a system to recover from disturbance in the event that the disturbance exceeds the capacity of the system to resist changing. The concepts of resistance and resilience are jointly referred to as resilience.

Resistance

The capacity of ecosystems to tolerate disturbances without exhibiting significant change in structure and composition. The concepts of resistance and resilience are jointly referred to as resilience.

Responsible official

The Forest Service employee who has the delegated authority to make a specific decision. For example, the regional forester will select the preferred alternative for the forest plan.

Restore/restoration

Assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity, and sustainability.

Revegetation

The reestablishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseeding.

Right-of-way

Land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project or facility passing over, upon, under, or through such land (36 CFR 251.51). The privilege that one person or persons particularly described may have of passing over the land of another in some particular line (FSH 2709.12 05 10).

Riparian area

A riparian ecosystem is a transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem, identified by soil characteristics or distinctive vegetation communities that require free or unbound water (FS-990A). Riparian areas may be associated with lakes, reservoirs, estuaries, hot springs, marshes, streams, bogs, wet meadows, and intermittent or permanent streams where free and unbound water is available. This habitat is transitional between true bottomland wetlands and upland terrestrial habitats, and while associated with watercourses, may extend inland or upland for considerable distances.

Road

A motor vehicle route more than 50 inches wide, unless identified and managed as a trail.

Road construction, reconstruction

Supervising, inspecting, and actual building and incurrence of all costs incidental to the construction or reconstruction of a road.

Road corridor

A strip of land between two points used by a road, or some future road whose exact location remains to be determined; generally with an indefinite width.

Road density

The number of road miles per square mile of land (i.e., 1 mile/square mile is 1 mile of road within a given square mile). This includes the total density all roads.

Road maintenance level

Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria (FSH 7709.58, section 12.3). The maintenance levels are:

Maintenance level 1 – Intermittent service roads during the time they are closed to vehicular traffic. The closure period is 1 year or longer. Basic custodial maintenance is performed.

Maintenance level 2 – Roads open for use by high-clearance vehicles, minor traffic, no warning signs. Passenger car traffic is not a consideration.

Maintenance level 3 – Roads open and maintained for a prudent driver in a standard passenger car, low speed travel, warning signs provided. User comfort and convenience are not considered priorities.

Maintenance level 4 – Roads that provide a moderate degree of user comfort and convenience at moderate travel speeds, single or double lane, aggregate or paved surface.

Maintenance level 5 – Roads that provide a high degree of user comfort and convenience, single or double lane, generally paved surface, or aggregate-surfaced with dust abatement.

Rocky Mountain Region

The Forest Service organizational unit consisting of Colorado, Wyoming, South Dakota, Nebraska, and Kansas. Also called Region 2.

S

Sacred site

Per Executive Order 13007 – any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the Indian tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.

Salvage harvest

Removal of trees that are damaged, dead, or dying or being damaged by injurious agents other than competition between trees, such as insect and disease epidemics, wildfire, or storms, to recover timber before it loses its commercial value.

Sanitation harvest

Intermediate harvest to remove trees to improve stand health by stopping or reducing the actual or anticipated spread of insects and diseases.

Sawtimber

Larger diameter trees of sufficient size and quality to be manufactured into dimensional lumber products. Species and minimum diameters of sawtimber trees are established by regional timber markets.

Scale

The degree of resolution at which ecological processes, structures, and changes across space and time are observed and measured.

Scenic character

A combination of the physical, biological, and cultural images that gives an area its scenic identity and contributes to its sense of place; scenic character provides a frame of reference from which to determine scenic attractiveness and to measure scenic integrity.

Scenic condition

Measurable standard for scenic resource management based on the acceptable degree of alteration of the characteristic landscape. The acceptable degree of alternation for a given landscape is dictated by the area's scenic integrity objective.

Scenic integrity objective

Scenic integrity objectives serve as the desired conditions for the scenic resources and represent the degree of intactness of positive landscape attributes. Scenic integrity objectives are categorized into five levels. The highest ratings are given to those landscapes where valued landscape attributes will appear complete with little or no visible deviations. Lower ratings are given to those landscapes where modifications will be more evident.

Very high – Landscape is intact with changes resulting primarily through natural processes and disturbance regimes.

High – Management activities are unnoticed and the landscape character appears unaltered.

Moderate – Management activities are noticeable but are subordinate to the landscape character. The landscape appears slightly altered.

Low – Management activities are evident and sometimes dominate the landscape but are designed to blend with surroundings by repeating line, form, color, and texture of valued landscape character attributes. The landscape appears altered.

Very low – Human activities of vegetation and landform alterations may dominate the original, natural landscape character but should appear as natural occurrences when viewed at background distances.

Scenic resource

The composite of basic physiographic features, patterns, and land-use effects that typify a land unit and influence the scenic appeal the unit may have for visitors.

Scoping

Determination of the significant issues to be addressed in an environmental impact statement.

Secure habitat

An area where wildlife retreat for safety when disturbance in their usual range is intensified, such as by logging activities or during hunting seasons.

Sedge

A grass-like plant with triangular stems and inconspicuous flowers, typically growing in wet ground.

Sediment

Material suspended in water or that has been deposited in streams and lakes.

Seedling/sapling

A forest successional stage in which trees are less than 5 inches in diameter.

Seral

The gradual supplanting of one community of plants by another, the sequence of communities being termed a sere and each stage seral (successional).

Seral stage

A phase in the sequential development of a climax community.

Shrub/seedling

A forest successional stage in which shrubs and seedling trees are the dominant vegetation.

Silvicultural treatment

A forest management activity such as thinning, harvesting, planting, pruning, prescribed burning, and site preparation that is designed to alter the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Silviculture

The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Single-tree selection

An uneven-aged method where individual trees of all size classes are removed more or less uniformly throughout the stand to promote growth of remaining trees and to provide space for regeneration.

Slash

Woody material left after logging, pruning, thinning, brush cutting, or other management activities and/or accumulating there as a result of storm, fire, or other damage.

Slope

The amount or degree of deviation from the horizontal or vertical.

Slope stability

The resistance of any inclined surface, as the wall of an open pit or cut, to failure by sliding or collapsing.

Snag

A standing, dead tree.

Social sustainability

The capability of society to support the network of relationships, traditions, culture, and activities that connects people to the land and to one another and supports vibrant communities.

Softwood

A conventional term for timber and trees belonging to the evergreen group, such as pine, spruce, and fir.

Soil productivity

The capacity of a soil to support the growth of specified plants, plant communities, or a sequence of plant communities. Soil productivity may be expressed in terms of volume or weight/unit, area/year, percentage of plant cover, or other measures of biomass accumulation.

Soil survey

The systematic examination, description, classification, and mapping of soils in an area.

Spatial

Referring to the distance, interval, or area between or within things.

Special area

Area designated by law (by Congress) or statute or through administrative process (by the Secretary of Agriculture or a Forest Service official).

Special interest area

A type of management area designated by the forest supervisor for scenic, geologic, botanic, zoologic, paleontological, archaeological, historic, scenic, or recreational values, or combinations of these values. A special interest area is a type of special area designated through administrative process. Special interest areas are addressed in Forest Service Manuals 2360 and 2372.

Special use authorization or permit

A permit, term permit, lease, or easement that allows occupancy, use, rights, or privileges of National Forest System land.

Species

Organisms that successfully reproduce among themselves and cannot reproduce successfully with other organisms.

Stand

A community of trees or other vegetation sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities that form a silvicultural or management entity.

Standards and guidelines

Principles specifying conditions or levels of environmental quality to be achieved.

Standard – a mandatory constraint on project and activity decision-making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. (36 CFR 219.7(e)(1)(iii))

Standards are required criteria for the design of projects and activities. Design criteria are the technical design details to ensure that projects and activities maintain or move toward the desired conditions, or at least to ensure that projects and activities do not preclude their maintenance or attainment. Design criteria provide the sideboards (i.e., define the limits) for projects and activities. Examples of other sources of constraints on the design of projects and activities include congressional direction, oil and gas leasing stipulations,

regulations, timber sale contract clauses, and special use authorization standard clauses. In addition, the responsible official may develop project-specific design criteria to constrain a project. A standard differs from a guideline in that a standard is strict design criterion, allowing no variation, whereas a guideline allows variation if the result would be equally effective.

Guideline – a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain a desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements. (36 CFR 219.7(e)(1)(iv))

Guidelines are similar to standards in that they are design criteria for projects and activities to help achieve the desired conditions and objectives, or at least to ensure that projects or activities do not foreclose their maintenance or attainment. Guidelines differ from standards in that they provide flexibility for compliance, while standards are concrete limitations.

Stewardship

Caring for the land and associated resources and passing healthy ecosystems to future generations.

Stipulation

A provision that modifies standard lease rights and is attached to and made a part of the lease.

Stocking

Live trees per acre needed to meet resource objectives as identified in the forest plan or through other management decisions.

Structural stage

Any of several developmental stages of tree stands described in terms of tree age or size and density. In general, the habitat structural stages developed by the Forest Service Rocky Mountain Region staff are used. This classification has different structural stages based on tree size (diameter at breast height) and tree canopy cover percent.

Structure

The horizontal and vertical physical elements of forests and grasslands and the spatial interrelationships of ecosystems.

Stubble

The basal portion of plants remaining after the top portion has been harvested. Also, the portion of the plants, principally grasses, remaining after grazing is completed.

Substrate

The rock material varying in size from boulders to silt that is found in the bed of rivers and streams.

Succession

The sequential process of long-term plant community change and development that occurs following a disturbance.

Successional stage (seral stage)

The relatively transitory communities that replace one another during development to potential natural community.

Suitability for grazing

The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of economic and environmental consequences, and the alternative uses forfeited. A unit of land may be suitable for a variety of individual or combined management practices. Suitability is a determination of the appropriateness of grazing on the capable lands based on economic and environmental consequences and consideration of alternative uses forfeited if grazing is allowed.

Suitability for timber production

Lands that may be suited for timber production is a preliminary classification in the process of determining lands that are suited for timber production. This preliminary classification excludes National Forest System lands that are not suitable for timber production based on legal or technical reasons, such as lands where State, Executive order, or regulation prohibits timber production; lands that have been withdrawn from timber production; lands where timber harvest cannot be done without causing irreversible damage to soil, slope, or other watershed conditions; lands where there is no reasonable assurance of adequate restocking; and land that is not forest land.

Suitable timber base

Lands within the National Forest System that are capable, available, and suitable for timber production.

Suppression

The work of extinguishing a fire or confining fire spread.

Surface water

Water on the surface of the earth.

Sustainability

The capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs.

Sustained yield

The amount of renewable resources that can be produced continuously at a given intensity of management.

“Sustained yield of the several products and services” means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land. (36 CFR 219.3)

Sustained yield limit

The amount of timber, meeting applicable utilization standards that can be removed from a forest annually in perpetuity on a sustained yield basis. It is the volume that could be produced in perpetuity on lands that may be suitable for timber production. Calculation of the limit includes volume from lands that may be deemed not suitable for timber production after further analysis during the planning process. The calculation of sustained yield limit is not limited by land management plan desired condition, other plan components, or the planning unit’s fiscal capability and organizational capacity. The sustained yield limit is not a target but is a limitation on harvest, except when the plan allows for a departure.

T

Talus

The loose accumulation of fragmented rock material on slopes, especially at the base of a cliff.

Temporary road

A road necessary for emergency operations or authorized by contract, permit, lease, or other written authorization. Temporary roads are not included in a national forest's transportation atlas.

Terrestrial ecosystem

A plant community that is not dependent on a perpetual source of water to grow.

Thinning

Intermediate treatment to reduce stand density or stocking levels to meet a variety of management objectives including increasing tree growth or vigor, improving stand health or species composition, reducing fuels, or improving wildlife habitat.

Threatened and endangered species

An endangered species is a plant or animal species listed under the Endangered Species Act that is in danger of extinction throughout all or a significant portion of its range. A threatened species is any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Threshold

The point or level of activity beyond which an undesirable set of responses begins to take place within a given resource system.

Timber classification

Forested land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classifications:

Nonforested – Land that has never supported forests and land formerly forested where use for timber production is precluded by development or other uses.

Forested – Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

Suitable – Land to be managed for timber production on a regulated basis.

Unsuitable – Forest land withdrawn from timber use by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the forest planning process.

Timber harvest

The removal of trees for wood fiber utilization and other multiple-use purposes.

Timber production

The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use.

Managing land to provide commercial timber products on a regulated basis with planned, scheduled entries.

Timber sale

Selling of forest products with monetary value to meet forest plan objectives, including providing raw material for both commercial manufacturing and personal use.

Trail

A route 50 inches or less in width, or a route greater than 50 inches wide that is identified and managed as a trail.

Traditional cultural property

A property affiliated with traditional religious and cultural importance to a distinct cultural group, such as an American Indian tribe or Native Hawaiian group, that is eligible for the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Traditional cultural properties include built or natural locations, areas, or features considered sacred or culturally significant by a group or people. While traditional cultural properties are closely associated with Native American cultures, a site need not be associated with a Native American cultural group to qualify as a traditional cultural property for the purposes of the National Register of Historic Places.

Travel management

Providing for safe, environmentally responsible, and customer-responsive movement of vehicles and people to and through public lands.

U

Understory

That portion of a plant community growing underneath the taller plants on the site.

Uneven-aged management

The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is typically regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree and group selection. (36 CFR 219.3)

Ungulate

A hooved animal.

Unplanned ignition

Fires caused by natural ignition (lightning) or human caused fires that are not prescribed fires (see wildfire).

V

Vegetation management

Activities designed primarily to promote the health of forest vegetation in order to achieve desired results. When vegetation is actively managed, it is manipulated or changed by humans to produce desired results. Where active management of vegetation is required, techniques are based on the latest scientific research and mimic natural processes as closely as possible. Vegetation management is the practice of manipulating the species mix, age, fuel load, and/or distribution of wildland plant communities within a prescribed or designated management area in order to achieve desired results.

Viable population

A population of plants or animals large enough and distributed in such a way as to ensure its continued existence, despite all the hazards to survival such as illness, predators, old age, etc. throughout its existing range within the planning area.

Viewshed

The visible portion of the landscape seen from viewpoints. Viewpoints can include residences, recreational facilities, and roads and trails.

W

Water right

A property right granted by a State for the use of a portion of the public's surface water resource obtained under applicable legal procedures.

Watershed

An area of land with a characteristic drainage network that contributes surface or groundwater to the flow at that point; a drainage basin or a major subdivision of a drainage basin.

Wetlands

Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that, under normal circumstances, do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” (40 CFR 122. 2)

Wild, Scenic, and Recreational Rivers

A river or section of a river designated under the 1968 Wild and Scenic Rivers Act as wild, scenic, or recreational. Rivers may be designated by Congress or, if certain requirements are met, the Secretaries of Interior or Agriculture, as appropriate. Once designated under the Act, rivers receive special management direction that ensures the maintenance of the free-flowing nature and the outstanding natural, cultural, and recreational values of the river segment. Under the Act, river segments are required to be classified as wild, scenic, or recreational:

Wild Rivers – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic Rivers – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational Rivers – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Wilderness

All lands included in the National Wilderness Preservation System by public law; generally defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation.

Wildfire

Unplanned ignitions or prescribed fires that have been declared wildfires. All wildfires will receive appropriate suppression action.

Wildland fire

A general term describing any nonstructural fire that occurs in the wildland. Wildland fires are categorized into two distinct types:

Wildfires – Unplanned ignitions or prescribed fires that are declared wildfires

Prescribed fires – Planned ignitions.

Wildland-urban interface

The line, area, or zone where structures and other human developments meet or intermingle with undeveloped wildland or vegetation fuels.

Windthrow

The act of trees being uprooted by the wind.

Winter range

An area used by deer and elk during the winter months; generally at lower elevations and/or south and west exposures.

Withdrawal

An action that restricts the use of public land and segregates the land from the operation of some or all of the public land and mineral laws. Withdrawals are also used to transfer jurisdiction of management of public lands to other Federal agencies.

Appendices

Appendix A	Old Forest Criteria
Appendix B	Wild, Scenic, and Recreational River Eligibility Determination Process
Appendix C	Timber Suitability and Analysis
Appendix D	Species of Conservation Concern Presence and Concern for Persistence
Appendix E	Southern Rockies Lynx Amendment Direction
Appendix F	Riparian Management Zones
Appendix G	Priority Watersheds
Appendix H	Relevant Federal Statutes, Regulations, Policies, and Agreements
Appendix I	Proposed and Possible Actions

Appendix A. Old Forest Criteria

The criteria used for determining old forests (Table 17) on the Rio Grande are based on the Regional Guidelines (with slight modifications), which are documented in a publication called “Old-Growth Forests in the Southwest and Rocky Mountain Regions Proceedings of a Workshop,” March 9-13, 1992, Portal, Arizona, General Technical Report RM-213.

The old-forest characteristics for each cover type are as follows. To be identified as old forest, most of the characteristics need to be present.

Ponderosa Pine

- Age greater than or equal to 175
- Large trees per acre (greater than or equal to 16” DBH) greater than or equal 10
- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10” min DBH) greater than or equal 2

Mixed Conifer

- Age greater than or equal 175
- Large trees per acre (greater than or equal 16” DBH) greater than or equal 10
- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10” min DBH) greater than or equal 2
- Layers greater than or equal 2
- Downed Woody Material greater than or equal 5 tons per acre

Spruce/Fir

- Age greater than or equal 200
- Large trees per acre (greater than or equal 16” DBH) greater than or equal 10
- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10” min DBH) greater than or equal 2
- Layers greater than or equal 2
- Downed Woody Material greater than or equal 10 tons/acre

Aspen

- Age greater than or equal 100
- Large trees per acre (greater than or equal 14” DBH) greater than or equal 10
- Rot plus dead/broken tops per acre greater than or equal 1

Pinyon-Juniper

- Age greater than or equal 200
- Large trees per acre (greater than or equal 12” DRC) greater than or equal 30

- Rot + dead/broken tops per acre greater than or equal 1
- Snags (10" min DRC) greater than or equal 1

Table 17. Criteria used to determine old forest

Minimum Attributes	Ponderosa Pine	Spruce/Fir	Mixed Conifer	Aspen	Pinyon-Juniper
Age	175	200	175	100	200
DBH/DRC (inches)	16	16	16	14	12 (DRC)
Large trees/ac ≥ DBH/DRC	10	10	10	10	30
Rot + dead/broken tops per acre	1	1	1	1	1
Snags per acre	2	2	2	n/a	1
Layers (#)	n/a	2	2	n/a	n/a
Downed Woody Material (tons/acre)	n/a	10	5	n/a	n/a

Appendix B: Wild, Scenic, and Recreational River Eligibility Determination Process

Background

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act is notable in that it seeks to protect these rivers while at the same time acknowledging the benefits and necessity of appropriate developments within the river corridor. To be designated under the Act, a river segment must meet two fundamental requirements: the river segment must be “free-flowing” as defined by Section 16(b) of the Act, and the river segment must have one or more outstandingly remarkable values (Section 1(b)).

Rivers may be designated by Congress or, if certain requirements are met, the Secretaries of Interior or Agriculture, as appropriate. Once designated under the Act, rivers receive special management direction that ensures the maintenance of the free-flowing nature and the outstanding natural, cultural, and recreational values of the river segment. Under the Act, river segments are required to be classified as wild, scenic, or recreational:

- **Wild Rivers** – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- **Scenic Rivers** – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- **Recreational Rivers** – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Section 5(d)(1) of the Wild and Scenic Rivers Act requires that “*consideration shall be given by all Federal agencies involved to potential national wild, scenic, and recreational river areas*” during land management planning. To meet this requirement, Forest Service units conduct a systematic inventory of all river segments to determine if they meet the requirements for designation under the Act. In addition to studies initiated by land management agencies, Congress can direct the study of specific rivers (Section 5(a)). Rivers that have been inventoried and determined to meet the requirements of the Act, but that have not yet been designated, are considered to be either eligible or suitable (those that have been recommended to Congress and the President). These eligible and suitable segments are managed to maintain their free-flowing nature and outstandingly remarkable values until such time as they are designated under the Act or released from consideration.

Wild and Scenic Rivers Act and the Rio Grande National Forest

In 1975, Public Law 93-621 amended the original Wild and Scenic Rivers Act (PL 90-542) and directed that the three tributary forks of the Conejos River, as well as the main stem of the Conejos (excluding Platoro Reservoir) to its crossing of Highway 17 be studied for potential inclusion in the National Wild and Scenic Rivers System. In 1979, following substantial efforts,

recommendations regarding the Conejos River were made to the Secretary of Agriculture from the State of Colorado and the Forest Service. The recommended wild river segments were: El Rito Azul; the North, Middle, and South forks of the Conejos; as well as the main stem of the Conejos from Three Forks to Platoro Reservoir. Additionally, the main stem of the Conejos from the town of Platoro to the confluence with South Fork of the Conejos was recommended as a recreational river segment. No legislative action has yet been taken on these recommendations (USDA Forest Service 1982).

During the 1996 revision of the forest plan, the Forest engaged in a systematic inventory and eligibility evaluation for all labeled rivers on U.S. Geological Survey 7.5-minute quadrangle maps. The eligibility evaluations from this process were combined with the results of the congressionally mandated Conejos River Study to develop a list of river segments that were potentially eligible for designation under the Wild and Scenic Rivers Act. These potentially eligible segments were included in the alternatives of the 1996 forest plan. The selected alternative, G, found that the river segments listed in Table 18 were eligible for inclusion in the National Wild and Scenic Rivers System. Further language within the 1996 forest plan directed that suitability determinations would be held in abeyance pending the proposal of significant actions that would impact the identified outstandingly remarkable values or the free-flowing nature of the river segments. Management areas and direction were developed for all eligible river segments that included the river and the lands within one-quarter mile on both sides of the mean high water mark. The length, outstanding remarkable values, and designation of each of the rivers and streams are listed in Table 18.

Wild and Scenic Rivers Act and the 2017 Rio Grande National Forest Plan Revision

The Forest engaged in the revision of the 1996 forest plan under the final directives of the 2012 Planning Rule. These directives state that when developing a plan or plan revision, the responsible official shall:

Identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System, unless a systematic inventory has been previously completed and documented, and there are no changed circumstances that warrant additional review. (36 CFR sec. 219.7(c)(2)(vi))

Given that a systematic inventory of rivers was completed and documented concurrent with the 1996 forest plan revision, the responsible official determined that no changed conditions existed and chose to limit the extent of the study process during the current revision to those river segments that were not previously inventoried.

Segments Determined to be Eligible in the 1996 Forest Plan

The river segments listed in Table 18 as eligible for inclusion in the National Wild and Scenic Rivers System will be carried forward in the forest plan revision. These river segments will retain the same classification, outstandingly remarkable values, river segment termini, and management direction. The only exceptions will be those segments of Medano Creek and Little Medano Creek that are on lands now managed by the National Park Service, which will administer these river segments through the National Park Service land management planning process.

Table 18. Eligible rivers for inclusion in the National Wild and Scenic Rivers System from the 1996 Rio Grande Forest Plan

River or Stream Name	Length (miles)	DS (UTM, Zone 13N)	US (UTM, Zone 13N)	Outstandingly Remarkable Values (Specific Value)	Designation
Archuleta Creek	5.35	356016, 4106182	359841, 4100089	Scenic, Recreational	Scenic
East Fork Rio Chama	2.05	362163, 4106170	362351, 4110553	Scenic, Recreational	Scenic
Hansen Creek	6.35	366267, 4121079	360459, 4127444	Scenic, Recreational	Wild
Little Medano Creek ^{1,2}	2.95	See note ^{1,2}	See note ^{1,2}	Scenic, Geologic, Fish (Rio Grande cutthroat trout)	Scenic
Rio de los Pinos (Lower)	7.50	381879, 4095041	376508, 4096178	Scenic, Recreational, Fish (Rio Grande cutthroat trout)	Scenic
Rio Grande (Lower)	5.00	347066, 4177909	341649, 4181683	Scenic, Recreational, Geologic, Historic	Recreational
Rio Grande (Box Canyon)	8.00	312013, 4183163	300751, 4177556	Scenic, Recreational, Fish, Historic (Within Box Canyon and Weminuche Wilderness)	Scenic
Saguache Creek	7.80	363847, 4213427	354709, 4208158	Scenic, Fish, Historic, Cultural (Large amounts of undisturbed native fish habitat and numerous cultural sites)	Wild
Toltec Creek	2.70	384913, 4095006	383112, 4098089	Scenic, Recreational, Historic (Cumbres and Toltec Scenic Railroad)	Wild
West Bellows Creek	10.75	339637, 4187358	342950, 4195670	Scenic, Recreational, Geologic, Historic (Cliffs below Wheeler Geologic Area)	Scenic
West Fork Rio Chama	3.50	362163, 4106170	359182, 4109807	Scenic, Recreational	Scenic
Medano Creek^{1,2}					
Medano Creek (Upper Reach)	3.15	See note ^{1,2}	See note ^{1,2}	Recreational, Fish (Rio Grande cutthroat trout)	Scenic
Medano Creek (Lower Reach)	5.30	See note ^{1,2}	See note ^{1,2}	Recreational, Fish (Rio Grande cutthroat trout)	Recreational
Medano Creek Total	8.45	See note ^{1,2}	See note ^{1,2}		
South Fork Rio Grande					
South Fork Rio Grande (Above Big Meadows Res.)	4.75	340081, 4155307	334268, 4152579	Scenic, Recreational, Historic (Within Weminuche Wilderness)	Scenic
South Fork Rio Grande (Below Big Meadows Res.)	13.90	353377, 4167424	340855, 4156351	Scenic, Recreational, Historic	Recreational
South Fork Rio Grande Total	18.65	-	-		
Conejos River					

River or Stream Name	Length (miles)	DS (UTM, Zone 13N)	US (UTM, Zone 13N)	Outstandingly Remarkable Values (Specific Value)	Designation
El Rito Azul	3.50	356317, 4126928	355621, 4122627	Scenic, Recreational, Wildlife (Alpine ecosystem, recreational fishing and hiking)	Wild
North Fork Conejos River	3.50	356010, 4126739	351006, 4128551	Scenic, Recreational, Wildlife (Glaciated alpine basin with grassy open parks)	Wild
Middle Fork Conejos River	4.00	356010, 4126739	350472, 4126691	Scenic, Recreational, Wildlife (Diverse streamflow characteristics, beaver ponds, elk and deer habitat)	Wild
Conejos River (Three Forks to Platoro Reservoir)	2.60	358768, 4130580	356327, 4126919	Scenic, Recreational, Wildlife (Glacial valley, Treasure Mountain tuff)	Wild
South Fork of the Conejos River	12.00	369412, 4120628	359190, 4124829	Scenic, Recreational, Wildlife (Alpine ecosystem, narrow an deep canyon, natural sloughing and mass soil movement, recreational fishery)	Wild
Conejos River below Platoro Reservoir ³	11.20	369777, 4120896	365820, 4134732	Scenic, Recreational, Wildlife (Recreational fishing, camping, glacial valley, few irrigation diversions)	Recreational
Conejos River Total	36.80	-	-		
Wild Rivers Sub-total	42.45	-	-		
Scenic Rivers Sub-total	48.00	-	-		
Recreational River Sub-total	35.40	-	-		
Rio Grande National Forest Total	125.85	-	-		

¹ Per the Great Sand Dunes National Park and Preserve Act of 2000, these streams are now part of the Great Sand Dunes National Preserve, managed by the National Park Service.

² The mileage division between the Scenic and Recreational Reaches is estimated based on the location of the Medano Pass Road; original documentation could not be found.

³ The Conejos Wild and Scenic River Study – Final Environmental Impact Statement initially determined 13.2 miles to be eligible; however, the 1982 recommendation from the Secretary of Agriculture to the President of the United States (Block 1982) eliminated 2 miles from the recommendation to avoid potential conflicts with private lands immediately below Platoro Reservoir.

Inventory of River Segments Not Evaluated as Part of the 1996 Forest Plan

A review of the inventory from the 1996 forest plan revision was conducted to determine those river segments that had been missed, or those that lacked sufficient documentation to determine the exact extent of the river segment that was evaluated. Initially, 34 stream segments were identified for review; however, four of these segments were not in the U.S. Geological Survey National Hydrography Dataset and were eliminated from consideration. One additional river segment, Osier Creek, which flows south to north and is tributary to the Rio de los Pinos (approximately 0.8 mile downstream from a separate Osier Creek that enters the Rio de los Pinos near Osier, Colorado), was identified during a review of the Carson National Forest Wild and Scenic River inventory. The 31 river segments that required inventory are listed in Table 19 and can be divided into 2 categories: 24 segments on National Forest System lands that were missed in the 1996 inventory, and 7 segments located on the Baca Mountain Tract, which were acquired as part of the Great Sand Dunes National Park and Preserve Act of 2000. These new segments on the Baca Tract were described in detail in the Baca Tract Environmental Assessment (USDA Forest Service and USDI National Park Service 2009).

The 31 river segments listed in Table 19 were evaluated in accordance with the direction provided in section 82.7 of FSH 1909.12-2015-1. The evaluation of the river segments was conducted by a sub-group of those individuals participating as members of the Forest Plan revision.

The process applied to the river segments listed in Table 19:

1. Determination of the free-flowing condition for each river segment (82.71 - FSH 1909.12-2015-1)
2. Evaluation of outstandingly remarkable values (82.73 - FSH 1909.12-2015-1)
 - The State of Colorado was selected as the region of comparison for all outstandingly remarkable values.
3. Preliminary classification of eligible river segments (82.8 - FSH 1909.12-2015-1)
 - This step determines if the eligible river segment should be wild, scenic, or recreational.
4. Engagement with ranger district staff
 - The process and results of the newly evaluated segments were presented to ranger district staff members. This step was designed to solicit more local expertise on the river segments in question, and to give local resource professionals the opportunity to concur with, or modify, all parts of the eligibility evaluation.
5. Delivery of the results of the preliminary evaluation to the responsible official
 - Under this evaluation, the responsible official has discretion over whether or not a river segment is eligible for inclusion in the National Wild and Scenic Rivers System.

Recommendations to the Responsible Official

The preliminary evaluation conducted by the interdisciplinary team resulted in a portion of Deadman Creek being recommended to the responsible official as eligible, with a scenic classification, for inclusion in the National Wild and Scenic Rivers System. The recommended reach is 3.3 miles long and is located on lands that were obtained as part of the Baca Mountain

Tract. The evaluated reach was determined to be free-flowing and contain the following outstandingly remarkable values:

- Scenery: An exceptional mature cottonwood and juniper gallery exists on the lower reaches.
- Fisheries: This is a Rio Grande cutthroat trout stream with exceptional habitat.
- Historic and Cultural: Unique features of the Old Spanish Trail exist within the river corridor.
- Other – Botanic: The mature cottonwood and juniper gallery represents a unique feature within the region of comparison. Additionally, there are occurrences of the plant species *Draba smithii* and *Draba grayana*; both are species of conservation concern and NatureServe Global Rank of G2 (Globally Imperiled), N2 (Nationally Imperiled) and S2 (Imperiled) in the State of Colorado.

Updated Data for Eligible River Segments

As part of the forest plan revision process, background data for the eligible river segments was updated to reflect the best available scientific information. Specifically, river segment lengths were updated to reflect the most recent National Hydrography Dataset issued by the U.S. Geological Survey. These updates do not reflect changes to the river segments determined to be eligible; rather, they reflect the improvement in data quality since 1996.

Table 19. Preliminary evaluation for inclusion in the National Wild and Scenic Rivers System, river segments missed in the 1996 Forest Plan

Characteristic				Presence of Outstandingly Remarkable Values							Preliminary Evaluation: Is the river segment eligible for WSR inclusion?
Segment Name	District	Length (miles)	Free-Flowing Condition?	Scenery	Recreation	Geology	Fish	Wildlife	Historic and Cultural Values	Other Similar River-related Values	
Baca Mountain Tract Acquisition											
Alpine Creek	Saguache	2.9	Yes	No	No	No	No	No	Yes	No	No
Cottonwood Creek	Saguache	2.8	Yes	No	No	No	Yes	No	No	No	No
Deadman Creek	Saguache	3.3	Yes	No	No	No	Yes	No	Yes	Yes	Yes-Scenic
Pole Creek	Saguache	4.4	Yes	No	No	No	No	No	Yes	No	No
Short Creek	Saguache	2.4	Yes	No	No	No	No	No	No	No	No
South Spanish Creek	Saguache	2.4	Yes	No	No	No	No	No	No	No	No
Spanish Creek	Saguache	5.4	Yes	No	No	No	No	No	No	No	No
Missed or not documented in the 1996 Eligibility Evaluation											
Asiatic Creek	Conejos Peak	2.1	Yes	No	No	No	No	No	No	No	No
Bird Creek	Divide	1.9	Yes	No	No	No	No	No	No	No	No
Cat Creek	Conejos Peak	3.9	Yes	No	No	No	Yes	No	No	No	No
Coal Creek	Conejos Peak	1.2	Yes	No	No	No	No	No	No	No	No
Cropsy Creek	Conejos Peak	1.7	Yes	No	No	No	No	No	No	No	No

Characteristic				Presence of Outstandingly Remarkable Values							Preliminary Evaluation: Is the river segment eligible for WSR inclusion?
Segment Name	District	Length (miles)	Free-Flowing Condition?	Scenery	Recreation	Geology	Fish	Wildlife	Historic and Cultural Values	Other Similar River-related Values	
East Fork Navajo River	Conejos Peak	0.9	Yes	No	No	No	No	No	No	No	No
Flagstaff Creek	Saguache	2.2	Yes	No	No	No	No	No	No	No	No
Jarosa	Conejos Peak	0.6	Yes	No	No	No	No	No	No	No	No
La Jara (north sections)	Conejos Peak	1.1 total	Yes	No	No	No	No	No	No	No	No
La Jara (south sections)	Conejos Peak	above	Yes	No	No	No	No	No	No	No	No
Little Red Creek	Saguache	1.3	Yes	No	No	No	No	No	No	No	No
Merkt Creek	Saguache	2.2	Yes	No	No	No	No	No	No	No	No
Middle Fork Cotton Creek	Saguache	1.5	Yes	No	No	No	No	No	No	No	No
Middle Fork North Crestone Creek	Saguache	2.1	Yes	No	No	No	No	No	No	No	No
Middle Fork Pole Creek	Divide	2	Yes	No	No	No	No	No	No	No	No
Middle Zapata Creek	Conejos Peak	3.1	Yes	No	No	No	No	No	No	No	No
North Fork Cedar Creek	Saguache	1.3	Yes	No	No	No	No	No	No	No	No
North Fork Pole Creek	Divide	3.4	Yes	No	No	No	No	No	No	No	No

Characteristic				Presence of Outstandingly Remarkable Values							Preliminary Evaluation: Is the river segment eligible for WSR inclusion?
Segment Name	District	Length (miles)	Free-Flowing Condition?	Scenery	Recreation	Geology	Fish	Wildlife	Historic and Cultural Values	Other Similar River-related Values	
North Fork South Zapata Creek	Conejos Peak	2.1	Yes	No	No	No	No	No	No	No	No
Osier Creek	Conejos Peak	0.8	Yes	No	No	No	No	No	No	No	No
Peterson Creek	Saguache	3.1	Yes	No	No	No	No	No	No	No	No
Rock Creek	Saguache	0.1	Yes	No	No	No	No	No	No	No	No
San Luis Creek	Saguache	2.1	Yes	No	No	No	No	No	No	No	No
South Fork Cedar Creek	Saguache	0.9	Yes	No	No	No	No	No	No	No	No

References Cited

- Block, J.R. 1982. Letter from Secretary of Agriculture John R. Block to President of the United States Ronald W. Reagan, dated June 11, 1982, regarding the segment of the Conejos River downstream from Platoro Reservoir for 2 miles. Available in the project record at the Rio Grande National Forest Supervisor's Office in Monte Vista, Colorado.
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Appendix C. Timber Suitability and Analysis

Lands that May be Suited for Timber Production

Lands that may be suited for timber production were determined using the criteria in the Land Management Planning Handbook FSH 1909.12 Chapter 60. These areas and associated acreage were determined by starting with the total area of the Rio Grande National Forest and removing areas that are not suited for timber production, listed below:

- In-holdings
- Level 2 through 5 roads
- Lands not suited for timber production because timber production is prohibited or the lands are withdrawn from timber production:
 - Wilderness areas
 - Eligible wild rivers
 - Colorado roadless areas
 - Research natural areas
- Lands on which technology to harvest timber is not currently available without causing irreversible damage:
 - Certain soil map units having “high mass movement potential” were removed due to this criteria. The criteria differed based on geographic area.
 - In the Sangre de Cristos, the following Soil Resource Inventory codes were removed: 410S, 605Y, 625S, 670S, 704S, 835X.
 - On the west side (everywhere except the Sangre de Cristos), soils were removed using a field called mass movement potential, with the exception of those polygons in the Cumbres area that have a Soil Resource Inventory of 139 or 151.
 - Note: In the 2000 amendment, Soil Types 460 and 750M were removed in only particular locations. This was not done because the 460 code is no longer used and because the locations where 750M was unsuitable had already been removed in prior steps.
- Lands on which there is no reasonable assurance that lands can be adequately restocked within 5 years of final regeneration harvest:
 - Elevations above 11,000 feet with south and southwest aspects
 - Elevations below 9,500 feet with south and southwest aspects
 - Areas with greater than 33 percent rock
- Land that is not Forest land
 - Areas with less than 10 percent canopy cover of trees were removed in this step. Areas that were formerly occupied by trees but with low canopy cover due to recent disturbance were not removed if tree species were regenerating.
- Areas with nonindustrial species, such as limber pine, bristlecone pine, pinyon, and juniper.

- True riparian areas (defined as an FSVeg Spatial local type of RIP (riparian) and cover type of grass, forb, or cottonwood).

The final area considered *may be suitable* for timber production is 499,936 acres.

Sustained Yield Limit Calculations

The sustained yield limit (SYL) is the amount of timber that can be produced on all lands that *may be suitable* for timber production, assuming all of these lands were managed to produce timber without considering other multiple uses or fiscal or organizational capability. The sustained yield limit was calculated using the Forest Vegetation Simulator (FVS, 7/19/16 version), the Forest Service's national forest growth and yield model. Site information from the stand exams collected over the last 20 years was used for this analysis. Sustained yield limit was calculated by the following strata, with the number of stands used in parentheses:

- Spruce-fir (405 stands)
- Aspen (103 stands)
- Lodgepole pine (59 stands)
- Ponderosa pine (64 stands)
- Mixed-conifer (243 stands)

Additional areas were also included separate from these main strata. This includes 1) 1M and 2S areas with low canopy cover (10 to 25 percent) that key out as grasslands or other non-timber types and which are not previously treed and 2) areas with low canopy cover (less than 25 percent) that have had recent disturbance but were previously treed.

Results from each stand were averaged together to get strata averages.

The management system, rotation age/entry interval, and associated harvest volume (cubic feet per acre) that were used to determine the sustained yield limit are listed in Table 20.

Table 20. Assumptions used for the sustained yield limit calculation

Strata	Management System	Rotation age / Entry Interval (years)	Acres of May be Suitable Lands	Harvest Volume (cubic feet/acre)
Spruce-fir	Uneven-aged – Group Selection	160	165,756	2,932
Lodgepole pine	Even-aged - Clearcut	120	22,198	2,697
Aspen	Even-aged - Clearcut	120	114,979	2,178
Mixed-conifer	Even-aged - Shelterwood	140	106,807	1,569
Ponderosa pine	Uneven-aged – Individual Tree Selection	30	18,542	400
Other - 1M and 2S		200	20,211	500
Other – timber		200	51,388	1,000

Strata	Management System	Rotation age / Entry Interval (years)	Acres of May be Suitable Lands	Harvest Volume (cubic feet/acre)
Other – Rock – Bare Soil	--	--	55	0

Numerous adjustments were made in Forest vegetation simulations to determine the appropriate harvest volume. These adjustments included factoring in defect, using local merchantability specifications, adjusting the stand density maximum values, calibrating tree growth based on collected tree growth data, and capping tree size based on observed tree sizes. Mortality due to insects and disease, such as spruce beetle, spruce budworm, Douglas-fir beetle, mountain pine beetle and/or engraver beetles, and tent caterpillar, aspen disease, and wood borers was included. Additional details on Forest vegetation simulation assumptions are available on request.

The estimated sustained yield limit is 7,374,937 cubic feet per year or 73,749 CCF per year.

Lands that Are Suited for Timber Production

The land suited for timber production under each alternative was defined using the criteria below. Starting with the may be suitable timber areas, the following areas were removed because timber production is not compatible with the desired conditions and objectives for these areas:

- Recommended wilderness, research natural areas, and wild rivers for the specific alternative
- National Scenic and Historic Trails – Continental Divide National Scenic Trail and Old Spanish Trail, including a one-half-mile buffer on each side
- National Recreation Trails - Lost Fork and West Lost Fork, including a one-half-mile buffer on each side
- Scenic rivers
- Current and proposed special interest areas (Management Area 3.1)
- Ski-based resorts (Management Area 8.22)
- Backcountry areas (Management Area 3.3) in any alternatives that have this.

Two main timber suitability changes from the 1996 Rio Grande Revised Land and Resource Management Plan pertain to the Grassland Resource Production areas (Management Area 6.6) and Bighorn Sheep management areas. The Grassland Resource Production areas are being considered suitable for timber production, a change from the 1996 plan, where they were not suitable. In addition, most, but not all, of the Bighorn Sheep management areas in the 1996 plan were merged into the Big Game Winter Range management area (Management Area 5.41) and are now considered suitable for timber production as a result. The suitable timber base is approximately 471,896 acres.

All areas of the suitable timber base were included because timber production is allowed and is consistent with the desired conditions and objectives for the area. However, some inclusions in the suitable timber base may not be currently feasible for timber production. This includes areas that are very difficult to reach (either because of distance or because they lack an appropriate transportation system), areas that would require helicopter logging, cable yarding, and areas that are extremely isolated.

Maps of the areas that are suitable for timber production under each alternative can be found on the external drive of maps located in the back of the document.

Appendix D. Species of Conservation Concern Presence and Concern for Persistence

Background

The 2012 Planning Rule and Forest Service Handbook 1909.12, Chapter 20, requires that species of conservation concern are identified for the planning area. More detailed analysis of these species can be found in Chapter 3 of the draft environmental impact statement for the forest plan. The 2012 Planning Rule requires the Forest Service to consider species that are known to occur in the planning area and that are established or are becoming established. We recognize that in practice, data on rare and declining species is often variable and incomplete, which complicates making confident presence/absence conclusions and introduces some potential risk for species not further considered for species of conservation concern status (or removing a species from the list).

For the purposes of “known to occur,” we have elected to require a record for a species on the planning unit to qualify for species of conservation concern status. Species that exist close to the planning area but that have not been recorded on the planning area are not considered to be known to occur on the planning unit. Species that are thought to be present in the plan area but that have not been documented there are also not considered as known to occur. The species must be documented on National Forest System lands within the boundary of the Forest. Species identified as Forest species of conservation concern and rationale for inclusion are contained in Table 21. All information pertains to the planning area.

The 2012 Planning Rule does not require the agency to consider those that are only transient or accidental, or that are well outside the existing range of the species. Only species that are considered established or are becoming established can be species of conservation concern.

An overview for each species has been prepared and is available on the Forest’s website. For each species, the overview considers:

- Status
- Taxonomy
- Distribution, abundance, and trend in the planning area
- A brief description of the natural history and key ecosystem functions
- Overview of ecological conditions necessary for the recovery of federally listed threatened and endangered species, conservation of proposed and candidate species, and maintenance of viable populations of species of conservation concern
- Threats and other risk factors.

Several criteria can be used to determine if a species is established. For plants, “established” means that it has roots in the ground or is otherwise attached to a substrate in the planning area, or has viable seeds in the seed bank produced by a plant that grew in the planning area in the last 20 years or so. Seeds do not remain viable forever, at least not in a naturalistic outdoor setting; the presence of viable seeds is generally an indication that the plants that produced the seeds were alive no more than a few decades ago.

For wildlife species, the determination of what is “established” is less clear. Reproduction by animals on the planning unit would certainly be considered a sign of that species being established. Frequent presence on the Forest, even if the animal breeds elsewhere, would also be considered a sign of being established. A single record for a species in the planning area may or may not qualify it for species of conservation concern status, depending on the overall context of the available information for that species when considering the record.

Occurrence data have been collected from multiple sources, including the Colorado Natural Heritage Program database (continually updated, the Forest Service acquires an updated copy once a year), herbarium records, mist-netting and sight/song bird surveys, and specialist reports.

Information from more detailed assessments and other sources used in determining eligibility for status as a species of conservation concern is summarized in Table 21 and Table 22. Links are provided in digital versions of the tables to take readers to overview assessments that are available on the Forest website. Information contained below applies to the Forest unless stated otherwise.

Most references contained here can be found in the *References Cited* section of the *Final Environmental Impact Statement* or in the species overviews that are linked below. Those references not listed in those locations are listed below the tables.

Plan components associated with the identified species of conservation concern (Table 23) are listed as a plan component crosswalk.

Table 21. Current species of conservation concern and evaluation criteria

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Invertebrates	Western bumblebee Bombus occidentalis	Located in 2016 by Rio Grande NF and USFS Rocky Mountain Region staff members during botany surveys.	This species has undergone a severe, range-wide population decline over the past decade, estimated at 40-90 percent. (Cameron et al. 2011) The population on the Forest appears to have mirrored this decline, which is on-going. The U.S. Fish and Wildlife Service currently has this species under review for possible listing under Endangered Species Act. The subspecies <i>occidentalis</i> found in the Rocky Mountain Region has declined about 70-99 percent since the late 1990s. The main cause of declines is thought to be the effects of a microsporidian <i>Nosema bombi</i> and an imported protozoan parasite from Europe. Other causes of decline include land use changes and habitat loss, changes in nectar flora, overgrazing, poorly timed fire in suitable nesting habitat, changes to temperature and precipitation regimes, competition with honey bees, and effects of pesticides especially persistent neonicotinoids. All of these threats occur.
Invertebrates	White-veined arctic butterfly Oeneis bore	Two records on the Forest from 2004, one in Hinsdale County and one in Saguache County. Records verified by USGS Northern Prairie Wildlife Research Center. One record from 1996.	As with many tundra relict species, changes in temperature and precipitation regimes could be a threat, as temperatures warm, species can move north or uphill to cooler refuges. In the case of species that exist on tundra in the southern Rockies, moving uphill is not an option as local populations already only survive on mountain tops. It is possible that warmer temperatures could lead to a loss of nectar plants to the butterfly, or the timing of the nectar bloom is changed relative to the life history needs of <i>O. bore</i> . Climate change vulnerability assessments in the vicinity of the Forest note that the white-veined arctic could be lost.
Amphibians	Boreal toad Anaxyrus boreas	Boreal toads have been reported at 10 sites in the past 20 years with the most recent observations occurring in 2014.	Primary localized threats on the Forest involve chytrid fungus with four of five known sites testing positive. Other local concerns involve water and air quality factors, nonnative species, recreation management and perhaps fire and timber management in localized areas. Climate change vulnerability assessments for areas surrounding the Forest have determined that this species is “highly vulnerable” to negative impacts from changes in temperature are precipitation regimes.
Fish	Rio Grande chub Gila pandora	Present in three stream segments; surveys by Colorado State University	The primary threats to this species include reduction of stream flows, increased sediment loads, and competition with and predation by nonnative fish. The limited remaining habitat for this species also renders the species at risk from stochastic events. NatureServe ranks this species as “Critically Imperiled” and Colorado Parks and Wildlife lists the species as “Tier 1, Species of Greatest Conservation Need”. Currently under review by the U.S. Fish and Wildlife Service for listing under the Endangered Species Act.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Fish	Rio Grande cutthroat trout Oncorhynchus clarkii virginalis	Present in 27 stream segments and 2 lakes.	Some recorded presence contradicts dramatic decline over its historic range that is now limited to small, isolated populations in the upper Rio Grande drainage in Colorado. Many of these populations are not self-sustaining and very vulnerable to habitat degradation from a variety of causes, competition and hybridization with nonnatives, over-utilization, and stochastic events. The Climate Change Vulnerability Assessment for the Colorado Bureau of Land Management described this species as having greatly increased vulnerability in its physiological, thermal, and hydrological niches due to potential changes in temperature and precipitation patterns. This species is wholly dependent upon human management to survive. Under current conditions, if management activities were to cease, the subspecies would be expected to resume a declining trend as a result of invasion of populations by nonnative salmonids, stochastic environmental events, whirling disease, and the demographic and genetic factors associated with small, isolated populations (Pritchard and Cowley 2006). Species is ranked by Colorado Parks and Wildlife as Species of Greatest Conservation Need Tier 1.
Fish	Rio Grande sucker Catostomus plebeius	Currently known from nine stream segments.	Competition with and predation by nonnative species are extensive threats to the health and persistence of Rio Grande sucker populations. Nonnative predators include northern pike and brown trout. The introduced white sucker tends to be well adapted to a variety of degraded environmental conditions, allowing it a competitive advantage on a spatial or temporal scale over the Rio Grande sucker. The larger white sucker competes with Rio Grande sucker for available food sources (periphyton and macroinvertebrates), and also has the ability to hybridize with Rio Grande sucker (Rees and Miller 2005).
Birds	Boreal owl Aegolius funereus	Eleven records in the past 20 years.	Boreal owls are threatened by loss of nesting habitat and changes in prey base resulting from substantially beetle killed spruce-fir habitat. Resulting in a reduction of closed canopy habitat available. Dramatic change (90 percent) in spruce-fir landscape conditions suggest potential declining habitat trend and species persistence. Other risk factors that may affect species density and distribution are likely to include large-scale stand replacement fire, and large-scale insect outbreaks. The Gunnison Basin Climate Change Vulnerability Assessment indicates that this species is "Highly Vulnerable" to changes resulting from changes in temperature and precipitation regimes. Colorado Natural Heritage Program S2 (Imperiled), Colorado Parks and Wildlife Species of Greatest Conservation Need Tier 2.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Birds	Brewer's sparrow Spizella breweri	Ten records in the past 10 years, most recently in 2014.	Rangewide concerns for substantial declines in sagebrush and mountain shrub habitats. The primary concern regarding the persistence of Brewer's sparrow is the continued decline of the species numbers in the area surrounding the Forest as well as pinyon juniper encroachment in the limited suitable sagebrush habitat. Trend estimates show significant decreases in relative abundance from 1966 to 2002. Detection frequencies during this period on routes in southern and eastern Colorado declined. Sauer et al. (2011) report significant declining trends of this species in the Southern Rockies/Colorado Plateau for the period 1966-2010. In addition, the Climate Change Vulnerability Assessment for the Colorado Bureau of Land Management shows that the species may experience a "Greatly Increased" vulnerability" due to the impacts that changes in temperature and precipitation regimes may have on the species that influence the habitat features required by Brewer's sparrow.
Birds	Flammulated owl Otus flammeolus	Sixty-five records in the past 20 years, the most recent observations in 2014.	Flammulated owls are threatened by loss of suitable nesting habitat. Replacement of open, old-growth ponderosa pine and mixed conifer forest with younger, high-density vegetation is considered detrimental to this species. Immediate threats include the loss of remaining areas of open, mature forest habitat due to departure from historic fire regimes and landscape scale disturbances such as stand replacement fire and bug infestations.
Birds	Northern goshawk Accipiter gentiles	As of 2015, at least 15 known active nesting territories, 3 historic territories, and 2 other potential territories.	Approximately 90 percent of the species habitat in the Southern Rockies is found on National Forest System lands. This species has experienced a decline in active nests over time. The loss of large nest trees in spruce-fir habitat is correlated with the impacts of beetles. A recent landscape study conducted in the San Juan Mountains of Colorado suggests substantial changes in landscape structure and fragmentation of mature forest have occurred in this area between 1950 and 1993. Many factors contribute to the changed condition including fire exclusion and maturing stand conditions in ponderosa pine. If this trend is representative of regional trends, goshawk habitat is probably declining in Region 2 (Kennedy 2003). Increase in younger tree age classes and loss of older trees associated with beetle kill are also a concern. Extensive habitat changes due to impacts of the bark beetle raises questions about long-term persistence on the forest and surrounding area. Detections and nest territory occupancy has declined in recent years based on project work and monitoring.
Bird	Olive-sided flycatcher Contopus cooperi	30 records	The concern for persistence of this species is based on a decline range-wide and Forestwide. This species has experienced at least a 50 percent decline based on Rocky Mountain Bird Observatory/Bird Conservancy of the Rockies data. Similar patterns of decline are evident on the Forest based on results of local Breeding Bird Survey results over the past decade. Primary species habitat on the Forest (spruce-fir) has experienced a 90 percent decline.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Birds	Peregrine falcon Falco peregrinus anatum	Twenty-two records with at least 12 eyries identified, of which 6 are active eyries, 5 are recent or historic eyries, and 1 is potential.	Local eyrie occupancy is declining. Delisted population is still monitored by the USFWS. Recovery of this species in other areas does not appear to be mirrored on the Forest. Stochastic impacts from recreational climbing have potential to cause nesting failure. Due to the small numbers of this species Forestwide, even a small number of failed nests could result in the extirpation of the species.
Birds	Southern White-tailed ptarmigan Lagopus leucurus altipetens	26 records	In the Rocky Mountains, approximately 95 percent of occupied ptarmigan habitats are on federal lands, 85 percent of which are National Forest System lands in Colorado and Wyoming. Region 2 populations are isolated from nearest northerly populations by long distances. As with many tundra relict species, changes in temperature and precipitation regimes could be a threat, as temperatures warm, species can move north or uphill to cooler refuges. In the case of species that exist on tundra in the southern Rockies, moving uphill is not an option as local populations already only survive on mountain tops. Warmer temperatures could lead to a loss of alpine tundra on the Forest. In this case, the Southern white-tailed ptarmigan could be lost from the Forest. Climate change vulnerability assessments for areas surrounding the Forest have determined that this species is "Highly Vulnerable" to negative impacts from changes in temperature and precipitation regimes. The species is under a 12 month review for possible Endangered Species Act listing by the U.S. Fish and Wildlife Service due to concerns for the present or threatened destruction, modification, or curtailment of the species' habitat or range due to changes to temperature and precipitation regimes. (Review is still ongoing as of 16 May 2017); state Tier 1 Species of Greatest Conservation Need.
Mammals	American marten Martes americana	Nine records	Marten is a closed canopy species therefore the 90 percent mortality in spruce-fir, due to beetle kill, creates a concern. This change in suitable habitat, including related declines in associated prey species such as the red squirrel as documented by Colorado Parks and Wildlife (Ivan 2017), creates a persistence concern for the species.
Mammals	Fringed myotis Myotis thysanodes	Roost site records include an underground mine occurring at 8,941 feet elevation. Acoustic surveys have positively identified the species at a low-elevation ponderosa pine stand in the Hot Creek RNA in 2013.	Concern for long-term persistence of this species stems from white-nose syndrome. Although not yet detected within Colorado, the disease continues to spread west. The agency has measures in place to protect bat roosts and maternity sites from white-nose syndrome, but it remains possible for the disease to infect colonies despite these measures. Based on patterns occurring elsewhere a loss of 80 to 90 percent of the affected bat species could be realized which includes the potential loss of entire colonies. Protection and maintenance of roost sites is also a potential issue. Since only one colony occurs on the Forest, extirpation remains possible. In addition, the Climate Change Vulnerability Assessment for the Colorado Bureau of Land Management suggests that fringed myotis may experience a "slight Increase" in vulnerability due to changes in its' hydrological niche and physical habitat due to changes in temperature regimes and precipitation patterns.
Mammals	Gunnison's prairie dog Cynomys gunnisoni	Eight known records in two general areas.	The persistence concern for this species is sylvatic plague, which often wipes out most if not all of infected colonies and often involving much larger populations than found on the Forest.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Mammals	Northern pocket gopher <i>Thomomys talpoides</i> <i>agrestis</i>	Confirmed presence of the vulnerable <i>agrestis</i> subspecies (CNHP 2006)	Stochastic human or natural events could extirpate this species due to the very small size of the area occupied by this subspecies. The subspecies is also very rare across its range, which is limited to the San Luis Valley (endemic).
Mammals	Plains pocket mouse <i>Perognathus flavesceus</i>	Two recent records (CNHP)	The concern for persistence is due to the limited habitat and very small area occupied by the species. Due to this small size, stochastic natural or human caused events could extirpate this species.
Mammals	River otter <i>Lontra canadensis</i>	Records from 2004 and 2010	Otters are threatened with extirpation mostly because they are already uncommon, and as such they are susceptible to stochastic events and human harassment. Relatively recent records indicate otters may be recolonizing the valley after an extended absence, perhaps stimulated by state recovery efforts. Opportunities exist to support that re-establishment through ongoing special habitat management attention.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Mammals	Rocky mountain bighorn sheep Ovis canadensis canadensis	Known to occur	<p>Bighorn sheep populations have declined in Western North America from an estimated 500,000 at the onset of European settlement to an estimated 15,000 to 20,000 by 1960. Numbers have increased since 1960 due to population translocations and augmentations and other conservation efforts. The distribution of bighorn sheep is naturally fragmented due to the patchy nature of preferred habitats, and bighorn sheep typically make seasonal movements to alpine habitats in summer and lower elevation habitats or south-facing slopes during the winter period.</p> <p>The primary risk to persistence on the Forest is pathogen transmission between domestic sheep and bighorn sheep, and subsequent disease outbreaks and population impacts. Current and expected future domestic sheep grazing includes some risk of contact between domestic sheep and bighorn sheep which can result in respiratory disease outbreaks in bighorn sheep. Respiratory disease in bighorn sheep can result in all age die-offs which can have lasting impacts on populations through suppressed lamb recruitment following disease outbreaks. In-breeding, loss of alpine habitat due to changing temperature and precipitation patterns, and unintentional human harassment can also represent added stressors further impacting persistence of local herds and populations.</p> <p>Despite the risks to bighorn sheep from domestic sheep, Forest bighorn sheep populations have persisted for the past several decades. Colorado Parks and Wildlife has identified 12 Game Management Units that occur entirely or partially on the Forest. Several herds cross administrative boundaries and occur on adjacent public or private lands during part of their life cycles. Overall population estimates for the 12 herds total approximately 1,100 individuals. The total population estimates have fluctuated from approximately 1,000 to 1,500 animals during the past 30 years. Population die-offs due to disease have been observed or suspected in several herds during this time, and some herds have been augmented via population translocations. Currently, several bighorn sheep herds are still recovering from die-off events in the 1990's. The presence of some type of respiratory pathogen has been confirmed in 8 herds. Most herds are currently hunted with regulations and population objectives established by Colorado Parks and Wildlife.</p> <p>Among the herds whose Game Management Unit boundaries overlap the Forest, three occur in areas where domestic sheep grazing is not currently permitted and is not anticipated in the foreseeable future. These herds (S08, S09, and S68, though S68) occur in the Sangre de Cristo mountains on the eastern Forest boundary and account for an estimated 40 percent of the Forestwide bighorn sheep population. While long-distance movements from other herds could potentially move pathogens into these herds, this is a relatively low likelihood concern and these herds are considered secure based on management actions under Forest authority.</p> <p>Other Forest herds are at some risk of contact with domestic sheep and transmission of pathogens is possible. Despite the risk to herds outside the Sangre de Cristo Mountains, bighorn sheep are likely to persist due to the strongholds in the Sangre de Cristo mountains and the absence of the domestic sheep grazing, the main threat to persistence. Population management by Colorado Parks and Wildlife will contribute to the persistence of bighorn sheep on the planning unit through establishing population objectives, managing hunting opportunities and potentially through population augmentation via translocations. Lastly, through collaborative monitoring with Colorado Parks and Wildlife and other partners will help provide information on the effectiveness of management actions and help identify potential changes in management needed to support the persistence of bighorn sheep.</p>

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Mammals	<u>Townsend's big-eared bat</u> <u><i>Corynorhinus townsendii townsendii</i></u>	Eleven records in the past 20 years.	Concern for the persistence stems from white-nose syndrome. Although not yet detected within Colorado, the disease continues to spread west. The agency has measures in place to protect bat roost and maternity sites from white-nose syndrome, but it remains possible for the disease to infect colonies despite these measures. An 80 to 90 percent loss of the species could be realized, including the loss of entire colonies. In addition, Climate change vulnerability assessments for the state indicate that this species may experience a slight increase in vulnerability due to changes in its physiological hydrological niche and physical habitat due to changes in temperature regimes and precipitation patterns.
Plants	<u>Black Canyon gilia</u> <u><i>Aliciella penstemonoides</i></u>	Known from six occurrences. Last observed in 1998.	This species is found in rocky areas with a spruce-fir overstory, the approximately 90 percent mortality of spruce is a threat to this species because of the resulting loss or alteration of this species' habitat from the loss of that canopy cover. Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is moderately vulnerable to negative impacts from changes in temperature and precipitation regimes, particularly because there are limits to dispersal. Forest occurrences are small and isolated populations which are susceptible to genetic drift and stochastic events.
Plants	<u>Stonecrop gilia</u> <u><i>Aliciella sedifolia</i></u>	This G1 species is known from two locations. Last observed in 2016. Of the entire global distribution of this species, two of the three occurrences are on the Forest.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes because of the loss of alpine habitat. Of the entire global distribution of this species, two of the three occurrences are on the Forest.
Plants	<u>Brandegee milkvetch</u> <u><i>Astragalus brandegeei</i></u>	Known from two occurrences. Both observed in 1986, aerial imagery indicates no evidence that the bristlecone habitat at these two locations has changed, thus there is no evidence to assume that the species is no longer present.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the bristlecone pine habitat of this species is highly vulnerable to negative impacts from changes in temperature and precipitation regimes across Colorado. Isolated and small Forest populations are susceptible to threats from genetic drift and stochastic events.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	<i>Ripley's milkvetch</i> <i>Astragalus ripleyi</i>	There are 22 known occurrences of this species last observed in 2016. The entire global distribution of this species is on or near the Forest.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes. This vulnerability is due to likely reductions in suitable habitat as well as alterations in the disturbance regime and its restriction to an uncommon geology.
Plants	<i>Northern moonwort</i> <i>Botrychium pinnatum</i>	Known from three occurrences, most recent observation in 2003.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is moderately vulnerable to negative impacts from changes in temperature and precipitation regimes that would result in the loss of the alpine portion of this species' habitat. Documented threats to this species include disturbance from vegetation management as well as sedimentation from roads. This species also occurs in spruce-fir and is threatened by the loss or alteration of that habitat from over story mortality. Aerial imagery from 2016 indicates that the canopy cover of spruce at all 3 of the occurrences of this species have been lost. One of the occurrences consists of a single individual while the largest is only 75. Small and isolated populations are susceptible to genetic drift and stochastic events.
Plants	<i>Least moonwort</i> <i>Botrychium simplex</i>	Known from a single occurrence. Last observation in 1995. Aerial imagery shows that the habitat at this occurrence is unchanged since 1995 and thus there is no evidence to assume the species is no longer present.	This species is found in spruce-fir habitat which has undergone a 90 percent mortality event resulting in a loss or alteration of this species' habitat. Aerial imagery from 2016 indicates that the canopy cover of spruce at this species' single occurrence has been lost. Climate change vulnerability assessments for areas surrounding the Forest indicate that the spruce-fir, fen, and montane riparian habitats are moderately threatened by changes in temperature and precipitation regimes. The single Forest occurrence consists of only 17 individuals. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	<i>Downy Indian-paintbrush</i> <i>Castilleja puberula</i>	This G2 species is known from three locations, the most recent observation is 2006.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes, has a limited dispersal ability, is dependent on snow and ice, and has migration barriers. Additionally, climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. One of the observations on the Forest is a few individuals scattered over a hundred acres. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	Dwarf alpine hawksbeard <i>Crepis nana</i>	Known from three locations, the most recent observation in 1998.	This species is documented to be negatively impacted by domestic livestock grazing.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	James' cryptantha <i>Cryptantha cinerea</i> var. <i>pustulosa</i>	This species observed at two locations in 2017.	Threats to the species that substantiate concern for persistence include managed and unmanaged off-highway vehicle use.
Plants	<i>Weber's catseye</i> <i>Cryptantha weberi</i>	This species is known from a single observation in 2005.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. Small and Isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	<i>Slender rock-brake</i> <i>Cryptogramma stelleri</i>	Known from a single occurrence. Last observation in 1988.	This species is found in spruce-fir habitat which has undergone a 90 percent mortality event resulting in a loss or alteration of this species' habitat. Aerial imagery from 2016 indicates that the canopy cover of spruce at the single occurrence of this species has been lost. Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes that may alter the cool moist dripping spring cliff habitat of this species. There are dispersal and migratory barriers for this species. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	<i>Mountain bladder fern</i> <i>Cystopteris montana</i>	Known from a single occurrence. Last observation in 1986.	This species is found in spruce-fir habitat which has undergone a 90 percent mortality event resulting in a loss or alteration of this species' habitat. Aerial imagery from 2016 indicates that the canopy cover of spruce at the single occurrence of this species has been lost. Climate change vulnerability assessments for areas surrounding the Forest indicate that the spruce-fir habitat of this species is moderately threatened by changes in temperature and precipitation regimes. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	<i>Colorado larkspur</i> <i>Delphinium alpestre</i>	There are three known occurrences of this G2 species, the most recent being in 1998.	Vulnerability Assessments for areas surrounding the Forest assessed the alpine habitat of this species and determined that it is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is threatened by the loss of its alpine habitat. Small and Isolated populations are susceptible to threats from genetic drift and stochastic events. Since small and isolated population only occur in a certain area and have a smaller population they are more susceptible to loss.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	<u>San Juan draba</u> <u>Draba graminea</u>	This G2 species is known from three locations and the most recent observation is from 2013.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes that may alter the alpine habitat of this species. The assessments indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is threatened by the loss of its alpine habitat. The species is reliant on ice and snow. There are dispersal and migratory barriers for this species. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	<u>Gray's draba</u> <u>Draba grayana</u>	This G2 species is known from two locations and the most recent observation is from 1985. Aerial imagery indicates that the alpine scree slope where this species was observed is unaltered and thus there is no evidence to assume the species is no longer present.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is threatened by the loss of its alpine habitat. Additional threats to this species include recreation and mountain goats. The occurrences are small and isolated and are thus susceptible to threats from genetic drift and stochastic events.
Plants	<u>Smith's draba</u> <u>Draba smithii</u>	G2 Species. There are 12 occurrences the most recent observation was in 2002.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. These assessments indicate that this species is extremely vulnerable to negative impacts from changes in seasonal precipitation as well as threats from energy development, its restriction to specific geologic substrates, dispersal barriers, and migration barriers. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.
Plants	<u>Colorado Divide whitlow-grass</u> <u>Draba streptobrachia</u>	Species is known from four occurrences, the most recent observation is from 2002.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. The species is reliant on ice and snow. There are dispersal and migratory barriers for this species. Small and isolated populations are susceptible to threats from genetic drift and stochastic events.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	Philadelphia fleabane Erigeron philadelphicus	Known from a single observation in 1990. Aerial imagery indicates that the wet meadow habitat where this species was observed is unaltered and thus there is no evidence to assume the species is no longer present.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the low elevation riparian and wetland habitat of this species is highly susceptible to changes in temperature and precipitation regimes. Small and isolated populations are susceptible to threats from genetic drift and stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	Many-flowered gilia Ipomopsis multiflora	Known from a single occurrence in 1986. Analysis of aerial imagery indicates that the open woodland habitat of this occurrence is unaltered and thus there is no evidence to assume the species is no longer present.	The single occurrence of this species is threatened by invasive plant species and impacts from the management of those invaders. Small and isolated populations are susceptible to threats from stochastic events and genetic drift. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	Spiny-spored quillwort Isoetes tenella	Known from four occurrences. The most recent was from 2000.	This species and its aquatic and fen habitat are threatened by alterations in flow from development and diversion. Similarly, climate change vulnerability assessments for areas surrounding the Forest indicate that the aquatic and fen habitat of this species is moderately vulnerable to changes in temperature and precipitation regimes. The occurrences of this species on the Forest are small and isolated which are susceptible to threats from genetic drift and stochastic events.
Plants	Colorado woodrush Luzula subcapitata	Known from three occurrences, the most recent in 2004.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species and its fen habitat are extremely vulnerable to negative impacts from changes in temperature and precipitation. This species lives on the margins of fens and riparian habitats which are susceptible to negative impacts from small changes in hydrology. The occurrences are small and isolated which are susceptible to threats from genetic drift and stochastic events
Plants	Colorado tansy aster Machaeranthera coloradoensis	Known from four occurrences. The most recent was from 1997.	Threats include recreation and road construction/maintenance, pipeline construction, and construction of radio towers.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	House's sandwort Minuartia macrantha	Species was collected in 2003. The single occurrence was from alpine habitat just east of Stony Pass.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes. These assessments indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and thus this species is threatened by the loss of its alpine habitat. Small and isolated populations are susceptible to genetic drift and loss from stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	Parry's crazy-weed Oxytropis parryi	Species was collected in 1998 and 1999, on rocky slopes north of Saguache and at the head of Raspberry Canyon.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. Small and isolated populations are susceptible to negative impacts from genetic drift and stochastic events.
Plants	West silver bladderpod <i>Physaria scrotiformis</i>	Single known occurred, documented summer 2017.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat.
Plants	Southern Rocky Mountain cinquefoil Potentilla ambigens	There are three occurrences of this species, the most recent observation is from 1998.	Threats to the species include recreation and trail use. Occurrences are less than 100 individuals. Small populations are susceptible to negative impacts from stochastic events, particularly species like this one that live close to rivers, streams, trails, and roads where these events are more likely.
Plants	Arizona willow Salix arizonica	G2 species found in a single location. Species was observed to be extant in 2016.	The single occurrence is documented to be threatened by livestock grazing, wildlife damage, and recreation. Climate change vulnerability assessments for areas surrounding the Forest indicate that the high elevation fen habitat of this species is also threatened by changes in temperature and precipitation resulting in changes in the hydrology. The single occurrence of Arizona willow is isolated from other occurrences of the species. Isolated populations are subject to negative impacts from genetic drift. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	Tundra saxifrage Saxifraga caespitosa ssp. monticola	Known from a single occurrence. Documented in 1998.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. The occurrence is isolated from other populations of this species. Isolated populations are susceptible to negative impacts from genetic drift. Species with single occurrences have particular persistence concerns because a single event can remove the species.

Category	Species	Evidence of Occurrence	Substantial Concern About the Species Capability to Persist over the Long Term
Plants	<u>King's campion</u> <u><i>Silene kingii</i></u>	G2 species known from a single occurrence, documented in 2005.	Climate change vulnerability assessments for areas surrounding the Forest indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and thus this species is threatened by the loss of its alpine habitat. The occurrence is isolated from other populations of this species. Isolated populations are susceptible to negative impacts from genetic drift. Species with single occurrences have particular persistence concerns because a single event can remove the species entirely.
Plants	<u>Fine bog-moss</u> <u><i>Sphagnum angustifolium</i></u>	There is a single occurrence along Iron Creek in 2016.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species and its high elevation fen habitat are threatened by changes in temperature and precipitation regimes. The population is small and isolated, and small and isolated populations are subject to threats from genetic drift and stochastic events. Species with single occurrences have particular persistence concerns because a single event can remove the species.
Plants	<u>Rothrock townsend-daisy</u> <u><i>Townsendia rothrockii</i></u>	G2 species known from three occurrences. The species was known to be extant in 2016.	Climate change vulnerability assessments for areas surrounding the Forest indicate that this species is extremely vulnerable to negative impacts from changes in temperature and precipitation regimes, particularly because it is dependent on ice and snow. These assessments indicate that the alpine habitat of this species is considered to be highly vulnerable to negative impacts from changes in temperature and precipitation regimes in southwest Colorado and this species is thus threatened by the loss of its alpine habitat. Additionally, the occurrences are small and isolated. Small and isolated populations are subject to threats from genetic drift and stochastic events.

Table 22. Species considered early but after further review were not identified as species of conservation concern

Category	Species	Evidence of Occurrence	Rationale for Not Including the Species as Draft SCC
Amphibian	Leopard frog <i>Rana pipiens</i>	Not known to occur	Locally this is primarily a lower-elevation species. Limited, but historical occurrence on Forest. No known existing populations or occurrences.
Bird	Grasshopper sparrow <i>Ammodramus savannarum</i>	Not known to occur	Very limited occurrence in select locations in the San Luis Valley. Very limited, if any, potential habitat on Forest.
Bird	Sage sparrow <i>Amphispiza belli</i>	Known to occur	Limited suitable habitat on the Forest and most occurrence records are peripheral, with only one documented occurrence in 2004. Very limited ability to influence species through management actions.
Bird	Golden eagle <i>Aquila chrysaetos</i>	Known to occur	Associated with primarily low-elevation open grasslands with rocky outcrops. Appears to be secure, occupying these habitats where expected, and, in some cases, at relatively high densities (up to 7 nesting eagles at locations). Also continues to enjoy protections under the Bald and Golden Eagle Protection Act.
Bird	Burrowing owl <i>Athene cunicularia</i>	Not known to occur	No occurrence on Forest documented through continuous survey efforts, including high-use areas such as prairie dog colonies.
Bird	Juniper titmouse <i>Baeolophus griseus</i>	Known to occur	Global and state rankings suggest species is secure globally and locally. No known substantial conservation concern.
Bird	Ferruginous hawk <i>Buteo regalis</i>	Not known to occur	Limited nesting occurrences are restricted to the valley floor. Very little if any potential habitat.
Bird	Cassin's finch <i>Carpodacus cassinii</i>	Known to occur	Global and state rankings suggest species is secure globally and locally. No known substantial conservation concern.
Bird	Veery <i>Catharus fuscescens</i>	Known to occur	No reported occurrences under existing databases. Potential evidence of recent breeding at one location. Presence is considered peripheral.
Bird	Mountain plover <i>Charadrius montanus</i>	Not known to occur	No occurrence documented through continuous survey efforts, including high-use areas such as prairie dog colonies.
Bird	Northern harrier <i>Circus cyaneus</i>	Not known to occur	Nesting habitat and occurrences primarily restricted to the valley floor. The Forest has little potential habitat.
Bird	Black swift <i>Cypseloides niger</i>	Known to occur	Survey efforts suggest the population is stable and secure statewide and locally. No documented connection or concerns about effects of Forest uses and management as primary risk factors. Unique species that may warrant other occasional monitoring efforts.
Bird	Prairie falcon <i>Falco mexicanus</i>	Known to occur	No known substantial conservation concern. Distribution is widespread and rangewide populations are thought to be stable. Cliff and outcrop breeding habitat is unchanged and secure.

Category	Species	Evidence of Occurrence	Rationale for Not Including the Species as Draft SCC
Bird	Pinyon jay Gymnorhinus cyanocephalus	Known to occur	No known substantial conservation concern. Limited management activity in available habitat. Global and state rankings suggest the species is secure.
Bird	Bald eagle Haliaeetus leucocephalus	Known to occur	No breeding or wintering confirmed and no clear evidence of concern for persistence. Species continues to enjoy important protections under the Bald and Golden Eagle Protection Act.
Bird	Loggerhead shrike Lanius ludovicianus	Known to occur	Occurrence is peripheral. Very few documented occurrences. Very little suitable habitat.
Bird	Virginia's warbler <i>Leiothlypis virginiae</i>	Known to occur	Fairly common to abundant nesting inhabitant in western Colorado, limited occurrences. Global and state ranking suggest the species is secure. High dispersal capability. Shrubland habitats are limited in availability and stable on the Forest, no known substantial conservation concern.
Bird	Brown-capped rosy finch Leucosticte australis	Known to occur	Breeding habitat consists of cliffs, caves, and rock crevices in alpine and tundra habitats that is stable and secure. Some uncertainty about sensitivity of alpine habitat to changes to precipitation and temperature regimes. The species is fairly common. No known substantial conservation concern.
Bird	Lewis's woodpecker Melanerpes lewis	Known to occur	Occurrence is peripheral and primarily associated with lower elevation cottonwood systems such as those along the Alamosa and Conejos River drainages. There are very few documented observations over the past 20 years. Very little suitable habitat is available.
Bird	Band-tailed pigeon <i>Patagioenas fasciata</i>	Known to occur	Migratory species. Occurrence is sporadic and seasonal with no known nesting occurrence.
Invertebrate	Monarch butterfly Danaus plexippus	Not known to occur	Limited available habitat.
Invertebrate	Theano alpine <i>Erebia pawloskii</i>	Not known to occur	Globally secure, moderate concern statewide. Not known to occur.
Invertebrate	Colorado blue (butterfly) Euphilotes rita coloradensis	Not known to occur	Lower elevation, prairie species. Very limited habitat.
Invertebrate	Alberta Arctic Oeneis Oeneis alberta	Known to occur	There are no records of this species occurrence. Bunchgrass habitat Forestwide is not at risk.
Invertebrate	Gold-edge gem moth Schinia avemensis	Not known to occur	Lower elevation species, limited habitat.
Invertebrate	Great Basin silverspot Speyeria nokomis nokomis	Not known to occur	Lower elevation species, limited habitat.

Category	Species	Evidence of Occurrence	Rationale for Not Including the Species as Draft SCC
Mammal	Hoary bat Lasiurus cinereus	Known to occur	Individuals detected locally during acoustic bat surveys. Forest occupancy is limited with a 5 occurrences reported over the past 20 years. Potential habitat loss a concern due to the loss of spruce habitat due to the impacts of spruce beetle. Abundant aspen forest remains unaffected and available. Windfarms are a primary threat, but none occur or are planned.
Mammal	Southern red-backed vole <i>Myodes gapperi</i>	Known to occur	Global and state rankings suggest species is secure in Colorado and locally. No known substantial conservation concern.
Mammal	Little brown bat <i>Myotis lucifugus</i>	Known to occur	Has experienced substantial population declines in Eastern and Midwestern states affected by white-nose syndrome. White nose syndrome has not yet occurred in Colorado; therefore, there is currently no known substantial conservation concern. Plan components address regarding abandoned mine features for bat species prior to closure.
Mammal	Big free-tailed bat Nyctinomops macrotis	Known to occur	Occurrence is peripheral. Very few documented occurrences, no known breeding or roosting areas on. Very little suitable habitat.
Mammal	American pika <i>Ochotona princeps</i>	Known to occur	In Colorado, species remains common in available talus habitat. Quantity of talus habitats remains stable. May be some concerns for effects of changes in temperature and precipitation regimes to alpine habitats but uncertain at this time. No known substantial conservation concern locally although occasional monitoring may be warranted.
Mammal	Abert's squirrel <i>Sciurus aberti</i>	Known to occur	Widespread through the ponderosa pine zone. No known substantial conservation concern.
Mammal	Dwarf shrew <i>Sorex nanus</i>	Not known to occur	No occurrences or known habitat.
Mammal	Botta's pocket gopher Thomomys bottae pervagus	Not known to occur	Species considered secure locally. Limited available habitat.
Plant	Rydberg's golden columbine Aquilegia chrysantha var. rydbergii	Not known to occur	
Plant	Vierhapper's/Alpine aster Aster alpinus var. vierhapperi	Known to occur	Too long a time has passed since observation for species to be known to occur.
Plant	Violet milkvetch <i>Astragalus iodopetalus</i>	Not known to occur	

Category	Species	Evidence of Occurrence	Rationale for Not Including the Species as Draft SCC
Plant	Missouri milkvetch Astragalus missouriensis var. humistratus	Not known to occur	
Plant	Aztec milkvetch <i>Astragalus proximus</i>	Not known to occur	
Plant	Crandall's rockcress <i>Boechera crandallii</i>	Not known to occur	
Plant	Narrowleaf grapefern Botrychium lineare	Not known to occur	
Plant	Winding mariposa lily <i>Calochortus flexuosus</i>	Not known to occur	
Plant	Lesser tussock sedge Carex diandra	Not known to occur	
Plant	Mud sedge Carex limosa	Known to occur	Too long a time has passed since observation for species to be known to occur.
Plant	Slender spiderflower Cleome multicaulis	Not known to occur	
Plant	Lesser yellow lady's – slipper Cypripedium parviflorum	Not known to occur	
Plant	Wahatoya larkspur Delphinium robustum	Not known to occur	
Plant	Heil's tansy mustard Descurainia kenheilli	Not known to occur	
Plant	Stream orchid, giant helleborine Epipactis gigantea	Not known to occur	
Plant	Brandeggee's buckwheat <i>Eriogonum brandegeei</i>	Not known to occur	
Plant	Colorado wild buckwheat Eriogonum coloradense	Not known to occur	

Category	Species	Evidence of Occurrence	Rationale for Not Including the Species as Draft SCC
Plant	Whitebristle cottongrass <i>Eriophorum altaicum</i> var. <i>neogaeum</i>	Known to occur	No concern for persistence.
Plant	Chamisso's cottongrass <i>Eriophorum chamissonis</i>	Not known to occur	
Plant	Slender cottongrass <i>Eriophorum gracile</i>	Not known to occur	
Plant	Bill's neoparrya <i>Neoparrya lithophila</i>	Known to occur	Present, no conservation concern due to stable populations that are largely free of threats.
Plant	Kotzebue's grass of Parnassus <i>Parnassia kotzebuei</i>	Not known to occur	
Plant	Degener's beardtongue <i>Penstemon degeneri</i>	Not known to occur	
Plant	Ice cold buttercup <i>Ranunculus karelinii</i>	Known to occur	Taxonomy issues make it difficult to judge the rarity of the species, as taxonomists are uncertain if this is a distinct species or part of a large, more common species. No state ranking because of taxonomic dispute.
Plant	Sageleaf willow <i>Salix candida</i>	Not known to occur	
Plant	Autumn willow <i>Salix serissima</i>	Not known to occur	
Plant	Weber's saw-wort <i>Saussurea weberi</i>	Not known to occur	
Plant	Pale blue-eyed grass <i>Sisyrinchium pallidum</i>	Not known to occur	
Plant	Baltic sphagnum <i>Sphagnum balticum</i>	Not known to occur	
Plant	Smooth Easter daisy <i>Townsendia glabella</i>	Not known to occur	
Plant	Lesser bladderwort <i>Utricularia minor</i>	Not known to occur	
Plant	New Mexico cliff fern <i>Woodsia neomexicana</i>	Known to occur	Occurrences are small and isolated and small and isolated populations are susceptible to negative impacts from genetic drift and stochastic events. However, this is not enough to substantiate a local concern for continued persistence.

Category	Species	Evidence of Occurrence	Rationale for Not Including the Species as Draft SCC
Plant	Plummer's cliff fern Woodsia plummerae	Known to occur	Occurrences are small and isolated and small and isolated populations are susceptible to negative impacts from genetic drift and stochastic events. However, this is not enough to substantiate a local concern for continued persistence.

Table 23. Crosswalk of species of conservation concern plan components

Category	Species	Plan Components that Provide Ecological Conditions to Maintain a Viable Population
Invertebrates	Western bumblebee Bombus occidentalis	G-SCC-1
Invertebrates	White-veined arctic butterfly Oeneis bore	G-SCC-1, G-SCC-4
Amphibians	Boreal toad Anaxyrus boreas	S-GDE-1, G-GDE-1, S-RMZ-1, G-RMZ-1, G-RMZ-2, S-WA-1, G-WA-1, G-WA-2, G-FISH-1, G-FISH-2, G-FISH-3, G-MIN-1
Fish	Rio Grande chub Gila pandora	S-GDE-1, G-GDE-1, S-RMZ-1, G-RMZ-1, G-RMZ-2, S-WA-1, G-WA-1, G-WA-2, G-FISH-1, G-FISH-2, G-FISH-3, G-MIN-1
Fish	Rio Grande cutthroat trout Oncorhynchus clarkia virginalis	S-GDE-1, G-GDE-1, S-RMZ-1, G-RMZ-1, G-RMZ-2, S-WA-1, G-WA-1, G-WA-2, G-FISH-1, G-FISH-2, G-FISH-3, G-MIN-1
Fish	Rio Grande sucker Catostomus plebeius	S-GDE-1, G-GDE-1, S-RMZ-1, G-RMZ-1, G-RMZ-2, S-WA-1, G-WA-1, G-WA-2, G-FISH-1, G-FISH-2, G-FISH-3, G-MIN-1
Birds	Boreal owl Aegolius funereus	G-VEG-1, S-VEG-4, S-VEG-5
Birds	Brewer's sparrow Spizella breweri	G-TEPC-1, G-SCC-3
Birds	Flammulated owl Otus flammeolus	G-VEG-1, G-VEG-5, S-VEG-4, S-VEG-5
Birds	Northern goshawk Accipiter gentiles	G-VEG-1, G-VEG-5, S-VEG-4, S-VEG-5
Bird	Olive-sided flycatcher Contopus cooperi	G-VEG-1, S-VEG4, S-VEG-5
Birds	Peregrine falcon Falco peregrinus anatum	S-WLDF-1
Birds	Southern White-tailed ptarmigan Lagopus leucurus altipetens	G-SCC-4

Category	Species	Plan Components that Provide Ecological Conditions to Maintain a Viable Population
Mammals	American marten <i>Martes americana</i>	G-VEG-5, S-TEPC-2
Mammals	Fringed myotis <i>Myotis thysanodes</i>	G-VEG-1, S-VEG-4, S-VEG-5
Mammals	Gunnison's prairie dog <i>Cynomys gunnisoni</i>	TEPC-G-1, G-SCC-3
Mammals	Northern pocket gopher <i>Thomomys talpoides agrestis</i>	
Mammals	Plains pocket mouse <i>Perognathus flavescens</i>	
Mammals	River otter <i>Lontra canadensis</i>	S-GDE-1, G-GDE-1, S-RMZ-1, G-RMZ-1, G-RMZ-2, S-WA-1, G-WA-1, G-WA-2, G-FISH-1, G-FISH-2, G-FISH-3, G-MIN-1
Mammals	Rocky mountain bighorn sheep <i>Ovis canadensis canadensis</i>	S-SCC-1, S-SCC-2, S-SCC-3, S-SCC-4, G-WLDF-1
Mammals	Townsend's big-eared bat <i>Corynorhinus townsendii townsendii</i>	G-SCC-5
Plants	Black Canyon gilia <i>Aliciella penstemonoides</i>	G-SCC-2
Plants	Stonecrop gilia <i>Aliciella sedifolia</i>	G-SCC-2
Plants	Brandegee milkvetch <i>Astragalus brandegeei</i>	G-SCC-2
Plants	Ripley's milkvetch <i>Astragalus ripleyi</i>	G-SCC-2
Plants	Northern moonwort <i>Botrychium pinnatum</i>	G-SCC-2
Plants	Least moonwort <i>Botrychium simplex</i>	G-SCC-2, S-SCC-1, G-GDE-1, S-RMZ-1
Plants	Downy Indian-paintbrush <i>Castilleja puberula</i>	G-SCC-2
Plants	Dwarf alpine hawksbeard <i>Crepis nana</i>	G-SCC-2
Plants	James' cryptantha <i>Cryptantha cinerea</i> var. <i>pustulosa</i>	G-SCC-2
Plants	Weber's catseye <i>Cryptantha weberi</i>	G-SCC-2

Category	Species	Plan Components that Provide Ecological Conditions to Maintain a Viable Population
Plants	<i>Slender rock-brake</i> <i>Cryptogramma stelleri</i>	G-SCC-2
Plants	<i>Mountain bladder fern</i> <i>Cystopteris montana</i>	G-SCC-2
Plants	<i>Colorado larkspur</i> <i>Delphinium alpestre</i>	G-SCC-2
Plants	<i>San Juan draba</i> <i>Draba graminea</i>	G-SCC-2
Plants	<i>Gray's draba</i> <i>Draba grayana</i>	G-SCC-2
Plants	<i>Smith's draba</i> <i>Draba smithii</i>	G-SCC-2, S-RMZ-1, G-RMZ-1
Plants	<i>Colorado Divide whitlow-grass</i> <i>Draba streptobrachia</i>	G-SCC-2
Plants	<i>Philadelphia fleabane</i> <i>Erigeron philadelphicus</i>	G-SCC-2, S-RMZ-1, G-RMZ-1
Plants	<i>Many-flowered gilia</i> <i>Ipomopsis multiflora</i>	G-SCC-2
Plants	<i>Spiny-spored quillwort</i> <i>Isoetes tenella</i>	S-GDE-1, G-GDE-1, G-RMZ-1, G-RMZ-2
Plants	<i>Colorado woodrush</i> <i>Luzula subcapitata</i>	S-GDE-1, G-GDE-1, G-SCC-2, G-RMZ-1, G-RMZ-2
Plants	<i>Colorado tansy aster</i> <i>Machaeranthera coloradoensis</i>	G-SCC-2
Plants	<i>House's sandwort</i> <i>Minuartia macrantha</i>	G-SCC-2
Plants	<i>Parry's crazy-weed</i> <i>Oxytropis parryi</i>	G-SCC-2
Plants	West silver bladderpod <i>Physaria scrotiformis</i>	G-SCC-2
Plants	<i>Southern Rocky Mountain cinquefoil</i> <i>Potentilla ambigens</i>	G-SCC-2
Plants	<i>Arizona willow</i> <i>Salix arizonica</i>	S-RMZ-1, G-RMZ-1, G-RMZ-2, G-SCC-2
Plants	<i>Tundra saxifrage</i> <i>Saxifraga caespitosa ssp. monticola</i>	G-SCC-2

Category	Species	Plan Components that Provide Ecological Conditions to Maintain a Viable Population
Plants	King's campion <i>Silene kingii</i>	G-SCC-2
Plants	Fine bog-moss <i>Sphagnum angustifolium</i>	S-GDE-1, G-GDE-2, G-SCC-2
Plants	Rothrock townsend-daisy <i>Townsendia rothrockii</i>	G-SCC-2

Appendix E. Southern Rockies Lynx Amendment Direction

Background

The Southern Rockies Lynx Amendment was completed in 2008 and when signed it effectively amended Forest Plan direction for the Canada Lynx (*Lynx canadensis*) on eight existing Forest Plan in the Rocky Mountain Region of the U.S. Forest Service, including the Rio Grande. That direction and the implementing guidance are not proposed to be changed at this time. Supplemental guidance is included in the Proposed Forest Plan that addresses the current conditions in the spruce-fir lynx habitat on the Forest.

The direction is incorporated here and would apply to implementation of the Proposed Forest Plan.

Southern Rockies Lynx Amendment – Management Direction

The management direction applies to lynx habitat on the following National Forests in the Southern Rockies Lynx Amendment area:

Medicine Bow Routt National Forests (two separate Plans), Arapaho-Roosevelt National Forests,

Grand Mesa, Uncompahgre and Gunnison National Forests, Pike-San Isabel National Forests,

Rio Grande National Forest, San Juan National Forest, and White River National Forest.

GOAL¹⁴

Conserve the Canada lynx.

ALL MANAGEMENT PRACTICES AND ACTIVITIES (ALL). The following objectives, standards, and guidelines apply to all management projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat and in linkage areas, subject to valid existing rights. They do not apply to wildfire suppression, or to wildland fire use.

Objective³⁰ ALL O1

Maintain²⁶ or restore⁴⁰ lynx habitat²³ connectivity¹⁶ in and between LAUs²¹, and in linkage areas²².

Standard⁴⁴ ALL S1

New or expanded permanent developments³³ and vegetation management⁵⁰ projects³⁶ must maintain²⁶ habitat connectivity¹⁶ in an LAU²¹ and/or linkage area²².

Guideline¹⁵ ALL G1

Methods to avoid or reduce effects on lynx should be used when constructing or reconstructing highways¹⁸ or forest highways¹² across federal land. Methods could include fencing, underpasses or overpasses.

Standard⁴⁴ LAU S1

Changes in LAU²¹ boundaries shall be based on site-specific habitat information and after review by the Forest Service Regional Office.

VEGETATION MANAGEMENT ACTIVITIES AND PRACTICES (VEG). The following objectives, standards, and guidelines apply to vegetation management projects³⁶ in lynx habitat within lynx analysis units (LAUs) in occupied habitat. With the exception of Objective VEG O3 that specifically concerns wildland fire use, the objectives, standards, and guidelines do not apply to wildfire suppression, wildland fire use, or removal of vegetation for permanent developments such as mineral operations, ski runs, roads, and the like. None of the objectives, standards, or guidelines apply to linkage areas.

Objective³⁰ VEG O1

Manage vegetation to mimic or approximate natural succession and disturbance processes while maintaining habitat components necessary for the conservation of lynx.

Objective VEG O2

Provide a mosaic of habitat conditions through time that support dense horizontal cover¹⁹, and high densities of snowshoe hare. Provide winter snowshoe hare habitat⁵¹ in both the stand initiation structural stage and in mature, multi-story conifer vegetation.

Objective VEG O3

Conduct fire use¹¹ activities to restore⁴⁰ ecological processes and maintain or improve lynx habitat.

Objective VEG O4

Focus vegetation management⁵⁰ in areas that have potential to improve winter snowshoe hare habitat⁵² but presently have poorly developed understories that lack dense horizontal cover.

Standard⁴⁴ VEG S1

Where and to what this applies: Standard VEG S1 applies to all vegetation management⁵⁰ projects³⁶ that regenerate³⁸ forested stands, except for fuel treatment¹³ projects³⁶ within the wildland urban interface⁵¹ (WUI) as defined by HFRA¹⁷, subject to the following limitation:

Fuel treatment projects³⁶ within the WUI⁵¹ that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests). In addition, fuel treatment projects may not result in more than three adjacent LAUs exceeding the standard.

For fuel treatment projects³⁶ within the WUI⁵¹ see guideline VEG G10.

The standard: Unless a broad scale assessment has been completed that substantiates different historic levels of stand initiation structural stages⁴⁵ limit disturbance in each LAU as follows:

If more than 30 percent of the lynx habitat in an LAU is currently in a stand initiation structural stage that does not yet provide winter snowshoe hare habitat, no additional habitat may be regenerated by vegetation management projects³⁶.

Standard VEG S2

Where and to what this applies: Standard VEG S2 applies to all timber management⁴⁷ projects³⁶ that regenerate³⁸ forests, except for fuel treatment¹³ projects³⁶ within the wildland urban interface⁵¹ (WUI) as defined by HFRA¹⁷, subject to the following limitation:

Fuel treatment projects³⁶ within the WUI⁵¹ that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests).

For fuel treatment projects³⁶ within the WUI⁵¹ see guideline VEG G10.

The standard: Timber management⁴⁷ projects³⁶ shall not regenerate³⁸ more than 15 percent of lynx habitat on NFS lands within an LAU in a ten-year period. This 15 percent includes the entire stand within an even-age regeneration area, and only the patch opening areas within group selections. Salvage harvest within stands killed by insect epidemics, wildfire, etc. does not add to the 15 percent, unless the harvest treatment would cause the lynx habitat to change to an unsuitable condition²⁴.

Standard VEG S5

Where and to what this applies: Standard VEG S5 applies to all precommercial thinning³⁵ projects, except for fuel treatment¹³ projects that use precommercial thinning as a tool within the wildland urban interface (WUI) as defined by HFRA, subject to the following limitation:

Fuel treatment projects within the WUI that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 may occur on no more than three percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests) for the life of this amendment.

For fuel treatment projects within the WUI see guideline VEG G10.

The Standard: Precommercial thinning practices and similar activities intended to reduce seedling/sapling density are subject to the following limitations from the stand initiation structural stage⁴⁵ until the stands no longer provide winter snowshoe hare habitat.

Precommercial thinning³⁵ may occur only:

1. Within 200 feet of administrative sites, dwellings, or outbuildings; or
2. For research studies³⁹ or genetic tree tests evaluating genetically improved reforestation stock; or
3. For conifer removal in aspen, or daylight thinning⁵ around individual aspen trees, where aspen is in decline; or
4. Based on new information that is peer reviewed and accepted by the

regional/state levels of the Forest Service and FWS, where a written determination states:

- a) That a project is not likely to adversely affect lynx; or
 - b) That a project is likely to have short term adverse effects on lynx or its habitat, but would result in long-term benefits to lynx and its habitat.
5. In addition to the above exceptions (and above and beyond the three percent limitation for fuels projects within the WUI⁵¹), precommercial thinning may occur provided that:
- a) The additional precommercial thinning does not exceed one percent of the lynx habitat in any LAU for the life of this amendment, and the amount and distribution of winter snowshoe hare habitat within the LAU must be provided through appropriate site-specific analysis and consultation; and
 - b) Precommercial thinning in LAUs with more than 30 percent of the lynx habitat currently in the stand initiation structural stage⁴⁵ is limited to areas that do not yet provide winter snowshoe hare habitat⁵²; and
 - c) Projects are designed to maintain lynx habitat connectivity¹⁶ and provide snowshoe hare habitat over the long term; and
 - d) Monitoring is used to determine snowshoe hare response.

Exceptions 2 and 3 may not occur in any LAU in which VEG S1 is exceeded (i.e., more than 30 percent of LAU in stand initiation structural stage).

Note: This standard is intended to provide snowshoe hare habitat while permitting some thinning, to explore methods to sustain snowshoe hare habitat over time, reduce hazardous fuels, improve forest health, and increase timber production. Project design must ensure any precommercial thinning provides an appropriate amount and distribution of snowshoe hare habitat with each LAU over time, and maintains lynx habitat connectivity within and between LAUs.

Project design should focus on creating irregular shapes for the thinning units, creating mosaics of thinned and unthinned areas, and using variable density thinning, etc.

Standard VEG S6

Where and to what this applies: Standard VEG S6 applies to all vegetation management⁵⁰ practices within multi-story mature or late successional conifer forests²⁹, except for fuel treatment¹³ projects within the wildland urban interface (WUI) as defined by HFRA¹⁷, subject to the following limitation:

Fuel treatment projects³⁶ within the WUI⁵¹ that do not meet Standards VEG S1, VEG S2, VEG S5, or VEG S6 shall occur on no more than 3 percent (cumulatively) of lynx habitat on each administrative unit (a National Forest or administratively combined National Forests).

For fuel treatment projects³⁶ within the WUI⁵¹ see guideline VEG G10.

The Standard: Vegetation management projects³⁶ that reduce winter snowshoe hare habitat⁵² in multi-story mature or late successional conifer forests²⁹ may occur only:

1. Within 200 feet of administrative sites, dwellings, outbuildings, recreation sites, and special use permit improvements, including infrastructure within permitted ski area boundaries; or
2. For research studies³⁸ or genetic tree tests evaluating genetically improved reforestation stock; or
3. For incidental removal during salvage harvest⁴¹ (e.g., removal due to location of skid trails); or
4. Where uneven-aged management (single tree and small group selection) practices are employed to maintain and encourage multi-story attributes as part of gap dynamics. Project design must be consistent with VEG O1, O2 and O4, except where impacts to areas of dense horizontal cover are incidental to activities under this exception (e.g., construction of skid trails).

Exceptions 2 and 4 may not occur in any LAU in which VEG S1 is exceeded.

Guideline VEG G1

Vegetation management⁵⁰ projects³⁶ should be planned to recruit a high density of conifers, hardwoods, and shrubs where such habitat is scarce or not available.

Priority for treatment should be given to stem-exclusion, closed-canopy structural stage⁴⁶ stands to enhance habitat conditions for lynx or their prey (e.g. mesic, monotypic lodgepole stands). Winter snowshoe hare habitat⁵² should be near denning habitat⁶.

Guideline VEG G4

Prescribed fire³⁴ activities should not create permanent travel routes that facilitate snow compaction. Constructing permanent firebreaks on ridges or saddles should be avoided.

Guideline VEG G5

Habitat for alternate prey species, primarily red squirrel³⁷, should be provided in each LAU.

Guideline VEG G10

Fuel treatment projects³⁶ within the WUI⁵¹ as defined by HFRA¹⁷ should be designed considering Standards VEG S1, S2, S5, and S6 to promote lynx conservation.

Guideline VEG G11

Denning habitat⁶ should be distributed in each LAU in the form of pockets of large amounts of large woody debris, either down logs or root wads, or large piles of small wind thrown trees (“jack-strawed” piles). If denning habitat appears to be lacking in the LAU, then projects³⁶ should be designed to retain some coarse woody debris⁴, piles, or residual trees to provide denning habitat⁶ in the future.

LIVESTOCK MANAGEMENT (GRAZ): The following objectives and guidelines apply to grazing projects in lynx habitat in lynx analysis units (LAUs) in occupied habitat. They do not apply to linkage areas.

Objective³⁰ GRAZ O1

Manage livestock grazing to be compatible with improving or maintaining²⁶ lynx habitat²³.

Guideline¹⁵ GRAZ G1

In fire- and harvest-created openings, livestock grazing should be managed so impacts do not prevent shrubs and trees from regenerating.

Guideline GRAZ G2

In aspen stands, livestock grazing should be managed to contribute to the long-term health and sustainability of aspen.

Guideline GRAZ G3

In riparian areas⁴¹ and willow carrs³, livestock grazing should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.

Guideline GRAZ G4

In shrub-steppe habitats⁴³, livestock grazing should be managed in the elevation ranges of forested lynx habitat in LAUs²¹, to contribute to maintaining or achieving a preponderance of mid- or late-seral stages, similar to conditions that would have occurred under historic disturbance regimes.

HUMAN USE PROJECTS (HU): The following objectives and guidelines apply to human use projects, such as special uses (other than grazing), recreation management, roads, highways, and mineral and energy development, in lynx habitat in lynx analysis units (LAUs) in occupied habitat, subject to valid existing rights. They do not apply to vegetation management projects or grazing projects directly. They do not apply to linkage areas.

Objective³⁰ HU O1

Maintain²⁶ the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat²³.

Objective HU O2

Manage recreational activities to maintain lynx habitat and connectivity¹⁶.

Objective HU O3

Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.

Objective HU O4

Provide for lynx habitat needs and connectivity when developing new or expanding existing developed recreation⁹ sites or ski areas.

Objective HU O5

Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat.

Objective HU O6

Reduce adverse highway¹⁸ effects on lynx by working cooperatively with other agencies to provide for lynx movement and habitat connectivity¹⁶, and to reduce the potential for lynx mortality.

Guideline¹⁵ HU G1

When developing or expanding ski areas, provisions should be made for adequately sized inter-trail islands that include coarse woody debris⁴, so winter snowshoe hare habitat⁵¹ is maintained.

Guideline HU G2

When developing or expanding ski areas, lynx foraging habitat should be provided consistent with the ski area's operational needs, especially where lynx habitat occurs as narrow bands of coniferous forest across mountain slopes.

Guideline HU G3

Recreation development and recreational operational uses should be planned to provide for lynx movement and to maintain the effectiveness of lynx habitat²³.

Guideline HU G4

Remote monitoring of mineral and energy development sites and facilities should be encouraged to reduce snow compaction.

Guideline HU G5

A reclamation plan should be developed (e.g., road reclamation and vegetation rehabilitation) for closed mineral and energy development sites and facilities that promote the restoration of lynx habitat.

Guideline HU G6

Methods to avoid or reduce effects to lynx habitat connectivity¹⁶ should be used when upgrading unpaved roads to maintenance levels 4 or 5²⁷, where the result would be increased traffic speeds and volumes, or contribute to development or increases in human activity.

Guideline HU G7

New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity¹⁶. New permanent roads and trails should be situated away from forested stringers.

Guideline HU G8

Cutting brush along low-speed, low-traffic-volume roads²⁵ should be done to the minimum level necessary to provide for public safety.

Guideline HU G9

If project level analysis determines that new roads adversely affect lynx, then public motorized use should be restricted. Upon project³⁶ completion, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

Guideline HU G10

Designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction¹, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs.

This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.

Use the same analysis boundaries for all actions subject to this guideline.

Guideline HU G11

When developing or expanding ski areas and trails, consider locating access roads and lift termini to maintain and provide lynx security habitat¹⁰.

Guideline HU G12

Winter access for non-recreation special uses and mineral and energy exploration and development should be limited to designated routes⁸ or designated over-the-snow routes⁷.

LINKAGE AREAS (LINK): The following objective, standard, and guidelines apply to all projects within linkage areas in occupied habitat, subject to valid existing rights.

Objective³⁰ LINK O1

In areas of intermingled land ownership, work with landowners to pursue conservation easements, habitat conservation plans, land exchanges, or other solutions to reduce the potential of adverse impacts on lynx and lynx habitat.

Standard⁴⁴ LINK S1

When highway¹⁸ or forest highway¹² construction or reconstruction is proposed in linkage areas²², identify potential highway crossings.

Guideline¹⁵ LINK G1

National Forest System lands should be retained in public ownership.

Guideline LINK G2

Livestock grazing in shrub-steppe habitats⁴³ should be managed to contribute to maintaining or achieving a preponderance of mid- or late-seral stages²⁸, similar to conditions that would have occurred under historic disturbance regimes.

Required Monitoring

1. Maps of the location and intensity of snow compacting activities and designated and groomed routes that occurred inside LAUs during the period of 1998 to 2000 constitute baseline snow compaction. Changes in activities and routes are to be monitored every five years after the decision.
2. When fuels treatment and vegetation management project decisions are signed, report the following:
 - a) Acres of fuel treatment in lynx habitat by Forest and LAU, and whether the treatment is within or outside the WUI as defined by HFRA.
 - b) Whether or not the fuel treatment met the vegetation standards or guidelines. If standard(s) were not met, report which standard(s) was not met, why it could not be met, and how many acres were affected.
 - c) Application of exceptions in Standard VEG S5:
For areas where any of the exceptions 1 through 5 listed in Standard VEG S5 were applied, report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.
 - d) Application of exceptions in Standard VEG S6:
For areas where any of the exceptions 1 through 4 listed in Standard VEG S6 were applied, report the type of activity, the number of acres, and the location (by unit, and LAU) and whether or not Standard VEG S1 was within the allowance.
 - e) Total acres of lynx habitat treated under exemptions and exceptions to vegetation standards, to assure the 4.5 percent limit is not exceeded on any Forest over the life of the amendment (15 years).
3. Application of guidelines:
 - a) Summarize what guideline(s) was not followed and why.
 - b) Document the rationale for deviations to guidelines.

Lynx Amendment Glossary

¹ *Area of consistent snow compaction* – An area of consistent snow compaction is an area of land or water that during winter is generally covered with snow and gets enough human use that individual tracks are indistinguishable. In such places, compacted snow is evident most of the time, except immediately after (within 48 hours) snowfall.

These can be areas or linear routes, and are generally found in or near snowmobile or cross-country ski routes, in adjacent openings, parks and meadows, near ski huts or plowed roads, or in winter parking areas. Areas of consistent snow compaction will be determined based on the acreage or miles used during the period 1998 to 2000.

² *Broad scale assessment* – A broad scale assessment is a synthesis of current scientific knowledge, including a description of uncertainties and assumptions, to provide an understanding of past and present conditions and future trends, and a characterization of the ecological, social, and economic components of an area. (LCAS)

³ *Carr* – Deciduous woodland or shrub land occurring on permanently wet, organic soil. (LCAS)

⁴ *Coarse woody debris* – Any piece(s) of dead woody material, e.g., dead boles, limbs, and large root masses on the ground or in streams. (LCAS)

⁵ *Daylight thinning* – Daylight thinning is a form of precommercial thinning that removes the trees and brush inside a given radius around a tree.

⁶ *Denning habitat (lynx)* – Denning habitat is the environment lynx use when giving birth and rearing kittens until they are mobile. The most common component is large amounts of coarse woody debris to provide escape and thermal cover for kittens.

Denning habitat must be within daily travel distance of winter snowshoe hare habitat – the typical maximum daily distance for females is about three to six miles. Denning habitat includes mature and old growth forests with plenty of coarse woody debris. It can also include young regenerating forests with piles of coarse woody debris, or areas where down trees are jack-strawed.

⁷ *Designated over-the-snow routes* – Designated over-the-snow routes are routes managed under permit or agreement or by the agency, where use is encouraged, either by on-the-ground marking or by publication in brochures, recreation opportunity guides or maps (other than travel maps), or in electronic media produced or approved by the agency.

The routes identified in outfitter and guide permits are designated by definition; groomed routes also are designated by definition. The determination of baseline snow compaction will be based on the miles of designated over-the-snow routes authorized, promoted or encouraged during the period 1998 to 2000.

⁸ *Designated route* – A designated route is a road or trail that has been identified as open for specified travel use.

⁹ *Developed recreation* – Developed recreation requires facilities that result in concentrated use. For example, skiing requires lifts, parking lots, buildings, and roads; campgrounds require roads, picnic tables, and toilet facilities.

¹⁰ *Diurnal security habitat (lynx)* – Places in lynx habitat that provide secure winter bedding sites in highly disturbed landscapes such as ski areas. Security habitat gives lynx the ability to retreat from human disturbance. Site characteristics and stand conditions make human access difficult and discourage human activity. Security habitats are sufficiently large to provide effective visual and acoustic insulation and to let lynx easily move away from any intrusion. Lynx security habitat must be in proximity to winter snowshoe hare habitat. (LCAS)

¹¹ *Fire use* – Fire use is the combination of wildland fire use and using prescribed fire to meet resource objectives. (NIFC) Wildland fire use is the management of naturally ignited wildland fires to accomplish resource management objectives in areas that have a fire

management plan. The use of the term wildland fire use replaces the term prescribed natural fire. (Wildland and Prescribed Fire Management Policy, August 1998)

¹² *Forest highway* – A forest highway is a forest road under the jurisdiction of, and maintained by, a public authority and open to public travel (USC: Title 23, Section 101(a)), designated by an agreement with the FS, state transportation agency, and Federal Highway Administration.

¹³ *Fuel treatment* – A fuel treatment is a type of vegetation management action that reduces the threat of ignition, fire intensity, or rate of spread, or is used to restore fire- adapted ecosystems.

¹⁴ *Goal* – A goal is a broad description of what an agency is trying to achieve, found in a land management plan. (LCAS)

¹⁵ *Guideline* – A guideline is a particular management action that should be used to meet an objective found in a land management plan. The rationale for deviations may be documented, but amending the plan is not required. (LCAS modified)

¹⁶ *Habitat connectivity (lynx)* – Cover (vegetation) in sufficient quantity and arrangement to allow for the movement of lynx. Narrow forested mountain ridges or shrub-steppe plateaus may serve as a link between more extensive areas of lynx habitat; wooded riparian communities may provide cover across open valley floors. (LCAS)

¹⁷ *HFRA (Healthy Forests Restoration Act)* - Public Law 108-148, passed in December 2003. The HFRA provides statutory processes for hazardous fuel reduction projects on certain types of at-risk National Forest System and Bureau of Land Management lands. It also provides other authorities and direction to help reduce hazardous fuel and restore healthy forest and rangeland conditions on lands of all ownerships. (Modified from Forest Service HFRA web site.)

¹⁸ *Highway* – The word highway includes all roads that are part of the National Highway System. (23 CFR 470.107(b))

¹⁹ *Horizontal cover* – The visual obscurity provided by vegetation that extends to the ground or snow surface, primarily provided by tree stems and tree boughs, but may also be provided by shrubs, herbaceous vegetation, and landscape topography.

²¹ *LAU (Lynx Analysis Unit)* – An LAU is an area of at least the size used by an individual lynx, from about 25 to 50 square miles (LCAS). An LAU is a unit for which the effects of a project would be analyzed; its boundaries should remain constant.

²² *Linkage area* – A linkage area provides landscape connectivity between blocks of lynx habitat. Linkage areas occur both within and between geographic areas, where blocks of lynx habitat are separated by intervening areas of non-lynx habitat such as basins, valleys, or agricultural lands, or where lynx habitat naturally narrows between blocks. (LCAS updated definition approved by the Steering Committee 10/23/01)

²³ *Lynx habitat* – Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters and provide a prey base of snowshoe hare. In the southern Rocky Mountains, lynx habitat generally occurs between 8,000 and 12,000 feet in elevation. Primary vegetation consists of Engelmann spruce, subalpine fir, aspen-conifer mix and lodgepole pine on spruce-fir habitat types. On cool moist sites, Douglas-fir and aspen, when interspersed with subalpine forests, may also contribute to lynx habitat. Dry forest types (e.g., ponderosa pine, climax lodgepole pine) do not provide lynx habitat. (LCAS)

²⁴ *Lynx habitat in an unsuitable condition* – Lynx habitat in an unsuitable condition consists of lynx habitat in the stand initiation structural stage where the trees are generally less than ten to 30 years old and have not grown tall enough to protrude above the snow during winter. Stand replacing fire, insect epidemics or certain vegetation management projects can create unsuitable conditions. Vegetation management projects that can result in unsuitable habitat include clearcuts and seed tree harvest, and sometimes shelterwood cuts and commercial thinning depending on the resulting stand composition and structure. (LCAS)

²⁵ *Low-speed, low-traffic-volume road* – Low speed is less than 20 miles per hour; low volume is a seasonal average daily traffic load of less than 100 vehicles per day.

²⁶ *Maintain* – In the context of this decision, maintain means to provide enough lynx habitat to conserve lynx. It does not mean to keep the status quo.

²⁷ *Maintenance level* – Maintenance levels define the level of service provided by and maintenance required for a road. (FSH 7709.58, Sec 12.3) Maintenance level 4 is assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most level 4 roads have double lanes and an aggregate surface. Some may be single lane; some may be paved or have dust abated. Maintenance level 5 is assigned to roads that provide a high degree of user comfort and convenience.

Normally, level 5 roads are have double lanes and are paved, but some may be aggregate surfaced with the dust abated.

²⁸ *Mid-seral or later* – Mid-seral is the successional stage in a plant community that is the midpoint as it moves from bare ground to climax. For riparian areas, it means willows or other shrubs have become established. For shrub-steppe areas, it means shrubs associated with climax are present and increasing in density.

²⁹ *Multi-story mature or late successional forest* – This stage is similar to the *old multistory structural stage* (see below). However, trees are generally not as old, and decaying trees may be somewhat less abundant.

³⁰ *Objective* – An objective is a statement in a land management plan describing desired resource conditions and intended to promote achieving programmatic goals. (LCAS)

³¹ *Old multistory structural stage* – Many age classes and vegetation layers mark the old forest, multistoried stage. It usually contains large old trees. Decaying fallen trees may be present that leave a discontinuous overstory canopy. On cold or moist sites without frequent fires or other disturbance, multi-layer stands with large trees in the uppermost layer develop. (Oliver and Larson, 1996)

³² *Old growth* – Old growth forests generally contain trees that are large for their species and the site, and are sometimes decadent with broken tops. Old growth often contains a variety of tree sizes, large snags, and logs, and a developed and often patchy understory.

³³ *Permanent development* – Any development that results in a loss of lynx habitat for at least the duration of a Forest Plan, approximately 15 years. Ski trails, parking lots, new permanent roads, structures, campgrounds, and many special use developments would be considered permanent developments.

³⁴ *Prescribed fire* – A prescribed fire is any fire ignited as a management action to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements met, before ignition. The term prescribed fire replaces the term management ignited prescribed fire. (NWCG)

³⁵ *Precommercial thinning* – Precommercial thinning is mechanically removing trees to reduce stocking and concentrate growth on the remaining trees, and not resulting in immediate financial return. (Dictionary of Forestry)

³⁶ *Project* - All, or any part or number of the various activities analyzed in an Environmental Impact Statement, Environmental Analysis, or Decision Memo. For example, the vegetation management in some units or stands analyzed in an EIS could be for fuel reduction, and therefore those units or stands would fall within the term *fuel treatment project* even if the remainder of the activities in the EIS are being conducted for other purposes, and the remainder of those units or stands have other activities prescribed in them. All units in an analysis do not necessarily need to be for fuel reduction purposes for certain units to be considered a *fuel reduction project*.

³⁷ *Red squirrel habitat* – Red squirrel habitat consists of coniferous forests of seed and cone-producing age that usually contain snags and downed woody debris, generally associated with mature or older forests.

³⁸ *Regeneration harvest* – The cutting of trees and creating an entire new age class; an even-age harvest. The major methods are clearcutting, seed tree, shelterwood, and group selective cuts. (Helms, 1998)

³⁹ *Research* – Research consists of studies conducted to increase scientific knowledge or technology. For the purposes of Standards VEG S5 and VEG S6, research applies to studies financed from the forest research budget (FSM 4040) and administrative studies financed from the NF budget.

⁴⁰ *Restore, restoration* – To restore is to return or re-establish ecosystems or habitats to their original structure and species composition. (Dictionary of Forestry)

⁴¹ *Riparian area* – An area with distinctive soil and vegetation between a stream or other body of water and the adjacent upland; includes wetlands and those portions of floodplains and valley bottoms that support riparian vegetation. (LCAS)

⁴² *Salvage harvest* – Salvage harvest is a commercial timber sale of dead, damaged, or dying trees. It recovers economic value that would otherwise be lost. Collecting firewood for personal use is not considered salvage harvest.

⁴³ *Shrub steppe habitat* – Shrub steppe habitat consists of dry sites with shrubs and grasslands intermingled.

⁴⁴ *Standard* – A standard is a required action in a land management plan specifying how to achieve an objective or under what circumstances to refrain from taking action. A plan must be amended to deviate from a standard.

⁴⁵ *Stand initiation structural stage* – The stand initiation stage generally develops after a stand-replacing disturbance by fire, insects or regeneration timber harvest. A new single-story layer of shrubs, tree seedlings, and saplings establish and develop, reoccupying the site.

Trees that need full sun are likely to dominate these even-aged stands. (Oliver and Larson, 1996)

⁴⁶ *Stem exclusion structural stage (Closed canopy structural stage)* – In the stem exclusion stage, trees initially grow fast and quickly occupy all of the growing space, creating a closed canopy. Because the trees are tall, little light reaches the forest floor so understory plants (including smaller trees) are shaded and grow more slowly. Species that need full sunlight usually die; shrubs and herbs may become dormant. New trees are precluded by a lack of sunlight or moisture. (Oliver and Larson, 1996)

⁴⁷ *Timber management* – Timber management consists of growing, tending, commercially harvesting, and regenerating crops of trees.

⁴⁸ *Uneven-aged timber management* - Uneven-aged management develops a stand with trees of three or more distinct age classes, either intimately mixed or in small groups of 2 acres or less (based on *The Dictionary of Forestry* Helms, 1998). Group openings do not exceed 20 percent of the stand in a single entry, but individual tree selection can occur throughout an entire stand or between the groups.

⁴⁹ *Understory re-initiation structural stage* – In the understory re-initiation stage, a new age class of trees gets established after overstory trees begin to die, are removed, or no longer fully occupy their growing space after tall trees abrade each other in the wind. Understory seedlings then re-grow and the trees begin to stratify into vertical layers. A low to moderately dense uneven-aged overstory develops, with some small shade-tolerant trees in the understory. (Oliver and Larson, 1996)

⁵⁰ *Vegetation management* – Vegetation management changes the composition and structure of vegetation to meet specific objectives, using such means as prescribed fire or timber harvest. For the purposes of this decision, the term does not include removing vegetation for permanent developments like mineral operations, ski runs, roads and the like, and does not apply to fire suppression or to wildland fire use.

⁵¹ *Wildland urban interface (WUI)* – Use the definition of WUI found in the Healthy Forests Restoration Act. The full text can be found at HFRA § 101. Basically, the wildland urban interface is the area adjacent to an at-risk community that is identified in the community wildfire protection plan. If there is no community wildfire protection plan in place, the WUI is the area 0.5 mile from the boundary of an at-risk community; or within 1.5 miles of the boundary of an at-risk community if the terrain is steep, or there is a nearby road or ridgetop that could be incorporated into a fuel break, or the land is in condition class 3, or the area contains an emergency exit route needed for safe evacuations. (Condensed from HFRA. For full text see HFRA § 101.)

⁵² *Winter snowshoe hare habitat* – Winter snowshoe hare habitat consists of places where young trees or shrubs grow densely – thousands of woody stems per acre – and tall enough to protrude above the snow during winter, so snowshoe hare can browse on the bark and small twigs (LCAS). Winter snowshoe hare habitat develops primarily in the stand initiation, understory reinitiation and old forest multistoried structural stages.

Appendix F. Riparian Management Zones

Background

Naiman et al. (2000) identifies that discoveries about the structure and dynamics of riparian zones have extended the scope of understanding about this portion of the landscape and have important implications for stream and watershed management. Forest plans must establish width(s) for riparian management zones around all lakes, perennial and intermittent streams, and open water wetlands (USDA Forest Service 2015). The following guidance has been developed to assist interdisciplinary teams in becoming familiar with and consistently applying criteria to: (1) appropriately delineate riparian management zones; and (2) analyze important considerations in developing appropriate management actions within or affecting riparian management zones. The objective is to ensure that interdisciplinary teams adequately consider riparian functions and ecological processes in both the delineation of riparian management zones and determination of appropriate management actions within or affecting riparian management zones.

Overview of the Riparian Management Zone Delineation Guidance

Aquatic and riparian systems are easily affected by land management activities on the surrounding hillslopes. Riparian management zones provide both a linkage and transitional habitat between hillslopes and upland terrestrial habitats and the aquatic habitats within stream channels.

In general, there is little controversy over the need to define riparian management zones in order to maintain riparian functions and ecological processes. The controversy is over the width of the riparian management zone, the extent and type of management activities that can occur within them, and the purposes for those activities. Management activities that occur within, or adjacent to, a riparian management zone are subject to specific goals, objectives, standards and guidelines. Forest plans and the associated management direction regulate two major features of riparian management zones: (1) their width; and (2) the kind and amount of activity that can take place within or influence them (Spence et al. 1996, Quigley and Arbelbide 1997, USDA 2015).

Riparian zones are among the most complex ecological systems and also among the most important for maintaining the vitality of the landscape and its rivers (Naiman et al. 2000). Evaluating the effectiveness of riparian management zones to manage for riparian functions and ecological processes is difficult because of the complexities of such areas, the extended time over which impacts can occur; and the resiliency and rate of recovery. The riparian management zone should be designed to maintain riparian functions and ecological processes with consideration of multiple scales (stream reach, sub-watershed, and watershed scale).

Riparian Management Zone Delineation Criteria for the Rio Grande National Forest

General Criteria

The following are criteria to be used to delineate riparian management zones for perennial and intermittent streams, ponds, lakes, reservoirs, and wetlands on the Forest.

I. Forested Fish Bearing Streams*

Perennial streams (and intermittent streams providing seasonal rearing and spawning habitat) – In the absence of local field data, 300-foot slope distance from the ordinary high water mark, OR Flood-prone width, OR two site-potential tree heights, OR to the outer edges of riparian vegetation, whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

II. Forested Non-Fish Bearing Streams*

In the absence of local field data, 150-foot slope distance from the ordinary high water mark, OR Flood-prone width, OR one site-potential tree height, OR to the outer edge of riparian vegetation, whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

III. Ponds, Lakes, Reservoirs, and Wetlands*

In the absence of local field data, 150-foot slope distance from the ordinary high water mark, OR outer edge of seasonally saturated soils, OR outer edge of riparian vegetation, OR one site-potential tree height, whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

IV. Intermittent and Non-Forested Streams*

In the absence of local field data, the outer edge of the riparian vegetation, OR 100-foot slope distance, OR one site-potential tree height whichever is greatest, OR defined based on a site-specific analysis by a qualified specialist with expertise in the field of riparian function and ecological processes.

*Note: Sediment delivery distances vary based upon the combination of proposed management actions and the inherent site characteristics. Because sediment delivery distances may exceed the selected option, riparian management zones may need to be adjusted to avoid or minimize delivery to the associated water body under any option.

Step-Down Process for Riparian Management Zone Delineation

Effective use of the riparian management zone delineation requires a full understanding of the selection criteria options within each of the four categories.

Delineating a riparian management zone requires two decisions to be made. First, the area needs to be correlated with one of the four Categories (I, II, III, or IV). The second decision is identifying which option, or criteria, within that category to use.

The decision as to which option or criteria should be chosen should occur through discussions with the interdisciplinary team, resource specialists, and/or the line officer. In general, determining the level of analysis that best suits the needs of the project will be driven by the potential effects of the project, baseline conditions, management direction, and issues associated with the project/area of interest that were identified through scoping, the work of the interdisciplinary team, or the line officer.

Written documentation of the chosen riparian management zone delineation option within a category, and the rationale behind the choice, should be included in record documentation for the project.

The options within a given category have varying levels of associated analysis that are involved with delineating the riparian management zone. Category IV, Non-forested Streams, differs from the other Categories in that it does not designate a set distance and therefore has two options rather than three.

Option 1

In lieu of field data, selection of the first option provides a conservative boundary--generally in excess of two site-potential tree heights in the case of the 300-foot slope distance, and greater than one site-potential tree height in the case of the 150-foot slope distance--that would be expected to account for most riparian processes including stream shading, large woody debris recruitment, fine organic litter input, bank stabilization, sediment filtration, windthrow, riparian microclimate and productivity, and wildlife habitat. Again, selection of this option is expected to provide land managers with the option of delineating a riparian management zone in the absence of field confirmation, with the expectation that the distances would account for most riparian functions and ecological processes in a system.

Option 2

The second criteria option, which is used similarly in Categories I-IV, requires field verification of certain site characteristics and provides a more site-based delineation of a riparian management zone boundary for a specific location. Depending on which category (I, II, III, or IV) is involved, options include use of site-potential tree height or riparian vegetation, whichever is greatest given the category.

Site-potential tree height is spoken to in the literature and correlated with the protection of riparian functions and ecological processes such as stream shading, LWD recruitment, fine organic litter input, bank stabilization, sediment filtration, windthrow, riparian microclimate and productivity, and wildlife habitat (Spence et al. 1996, Quigley and Arbelbide 1997).

Riparian vegetation is defined through classification of the vegetation associated with the aquatic habitat and its outer extent (see glossary), and it generally influences riparian processes such as fine organic litter input, bank stabilization, sediment filtration, stream shading, and wildlife habitat.

Option 2 requires the use of certain field data to be collected from the project area and analyzed to determine the boundary of the riparian management zone. It is considered an option requiring potentially less than a site-specific analysis (Option 3), but it is more appropriately tied to the landscape than a default distance might be (Option 1).

Option 3

The third option, which is used in Categories I-IV, is the use of a site-specific analysis to define the riparian management zone. This option requires potentially the most analysis of the three options. When defining the riparian management zone, the specialist conducts an on-site analysis of the riparian functions and ecological processes associated with the stream, pond, lake, reservoir or wetland, and defines the riparian management zone based on the distance that best encompasses the extent of those functions and processes. The value gained from this effort is a site-specific riparian management zone delineation appropriate to the functions and processes between upland terrestrial habitats and adjacent aquatic habitats for that area. This information

potentially provides more opportunities for project design because the existing condition is better known, and therefore effects of actions can be better assessed, and projects can be more responsive to needs of the aquatic ecosystem.

In summary, riparian management zone delineation is set up in a manner that provides flexibility for different levels of analysis that, regardless of the option chosen, will provide for riparian functions and ecological processes. The decision on which option to use must involve considerations of the project in regard to potential effects, baseline conditions, and issues and their relationship to riparian functions and ecological process.

The effectiveness of delineating an accurate riparian management zone provides decision-makers with the information necessary for sound decisions regarding management activities within a watershed. With an understanding of the riparian functions and ecological processes of a system, and the means by which actions may affect them, decision makers are provided an opportunity to design activities to maintain or restore listed fish species, their habitats, and other SWRA resources.

Site-Potential Tree Heights for Use in Identifying Riparian Management Zones

When planning and implementing vegetation management projects, distances equivalent to one or two site-potential tree heights may be used to determine riparian management zone boundaries, provided a site visit has been completed. Current conditions and dominant potential vegetation group (PVG) for the site/project area must be verified in the field.

Once the dominant PVG has been field-verified, the site-potential tree height criteria in Table 24 will be used to determine riparian management zone widths in the management units. See the glossary in this appendix for definitions of site-potential tree height, site tree, and seral tree species. For more information about forested vegetation and PVGs, refer to Appendix C of this forest plan.

Table 24. Site potential tree height by potential vegetation group

[Rounded average calculated from all available 1,044 stand exams from the Forest during 1995–2015.]

Potential Vegetation Group	Age	1 Site Tree Height (feet)	2 Site Tree Height (feet)
1 – Aspen forest, with and without softwoods	100	60	120
2 – Bristlecone pine / Limber pine	100	50	100
3 – Lodgepole pine	100	60	120
4 – Mixed conifer (cool-dry)	100	60	120
5 – Mixed conifer (cool-moist)	100	65	130
6 – Mixed conifer (warm-dry)	100	60	120
7 – Pinyon-juniper	100	20	45
8 – Ponderosa pine	100	60	120
9 – Spruce-fir	100	85	170

References Cited

- Megahan, W.F., and J. Hornbeck. 2000. Lessons learned in watershed management: A retrospective view. Proceedings, USDA Forest Service Rocky Mountain Research Station – P – 13.
- Naiman, R.J., R.E. Bilby, and P.A. Bisson. 2000. Riparian ecology and management in the Pacific coastal rain forest. Bioscience. November 2000 vol. 50, no. 11, pp. 996-1011.
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- Spence, B.C., and R.M. Hughes. 1996. An ecosystem approach to salmonid conservation. December 1996. TR-4501- 96-6057.
- USDA Forest Service. 1997. Riparian reserve evaluation techniques and synthesis, supplement to section II of Ecosystem Analysis at the Watershed Scale: Federal Guide for Watershed Analysis. Version 2.2.
- USDA Forest Service. 2015. Forest Service Handbook 1909.12, Land Management Planning Handbook. Chapter 20 – Land Management Plan. Amendment 1909.12-2015-1. Effective January 30, 2015.

Appendix G. Priority Watersheds

Background

The Forest Service uses the Watershed Condition Framework to assess and characterize the health and condition of subwatersheds (6th level or 12 digit hydrologic unit code). The Watershed Condition Framework employs a nationally consistent reconnaissance-level approach for classifying watershed condition, using a comprehensive set of 12 indicators that are surrogate variables representing the underlying ecological, hydrologic, and geomorphic functions and processes that affect watershed condition. Primary emphasis is on aquatic and terrestrial processes and conditions that Forest Service management activities can influence (USDA Forest Service 2011).

Watershed condition classification is the process of describing watershed condition in terms of discrete categories (or classes) that reflect the level of watershed health or integrity. The outcome of the classification process is to place each 6th level watershed into one of the classes described below:

- **Class 1:** Watersheds that are functioning properly exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- **Class 2:** Watersheds that are functioning at-risk exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.
- **Class 3:** Watersheds that have impaired function exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

A discussion of watershed conditions and trends specific to the Rio Grande National Forest is contained in the *Watershed Resources* section of the environmental impact statement associated with this forest plan revision. Following classification, priority watersheds are selected and watershed restoration action plans are developed to focus efforts that treat whole watersheds with an integrated set of watershed-scale restoration activities.

Further information on the Watershed Condition Framework can be found in Forest Service publication FS-977 (USDA Forest Service 2011). Additional information, maps, and documentation can be found at the Forest Service [watershed webpage](#).

Priority Watersheds

The 2012 Planning Rule requires land management plans to:

- (i) Identify watershed(s) that are a priority for maintenance or restoration; (36 CFR 219.7(f)(1)).

Identification of priority watersheds is done to focus effort on the integrated restoration of watershed conditions in these areas. Priority watersheds are those watersheds where plan objectives for restoration would concentrate on maintaining or improving watershed condition. However, selection of priority watersheds does not preclude watershed restoration efforts in other areas. The identification of priority watersheds is intended to be helpful to Forest Service managers as they schedule work after plan approval, especially in circumstances of limited budgets and resources. Changes as to which watersheds in the plan are “priority” are made by administrative change (sec. 21.5 of FSH 1909.12) (USDA Forest Service 2012).

The Rio Grande National Forest has identified the following priority watersheds:

- Archuleta Creek (130201020202)
- Headwaters Rio Chama (130201020201)21
- Middle Fork Carnero Creek (130100040401).

References Cited

USDA Forest Service. 2011. Watershed condition framework: A framework for assessing and tracking changes to watershed condition. FS-977. 34 pp. Accessed August 8, 2017, at https://www.fs.fed.us/sites/default/files/Watershed_Condition_Framework.pdf

USDA Forest Service. 2012. Forest Service Handbook 1909.12: Land Management Planning Handbook, chapter 20. 134 pp.

Appendix H. Relevant Federal Statutes, Regulations, Policies, and Agreements

Management direction in the Forest Service Directive System, including the Forest Service manuals and handbooks, is part of the forest plan management direction and is not repeated in the forest plan directions. Management direction also includes applicable laws, regulations, and policies, although they are not restated in this forest plan.

Direction for managing National Forest System land comes from a variety of levels. National and regional direction includes laws, Executive orders, regulations, and Forest Service policies. The hierarchy of management direction from national and regional direction to the site-specific, project-level direction used in implementing the forest plan is illustrated in Figure 16.

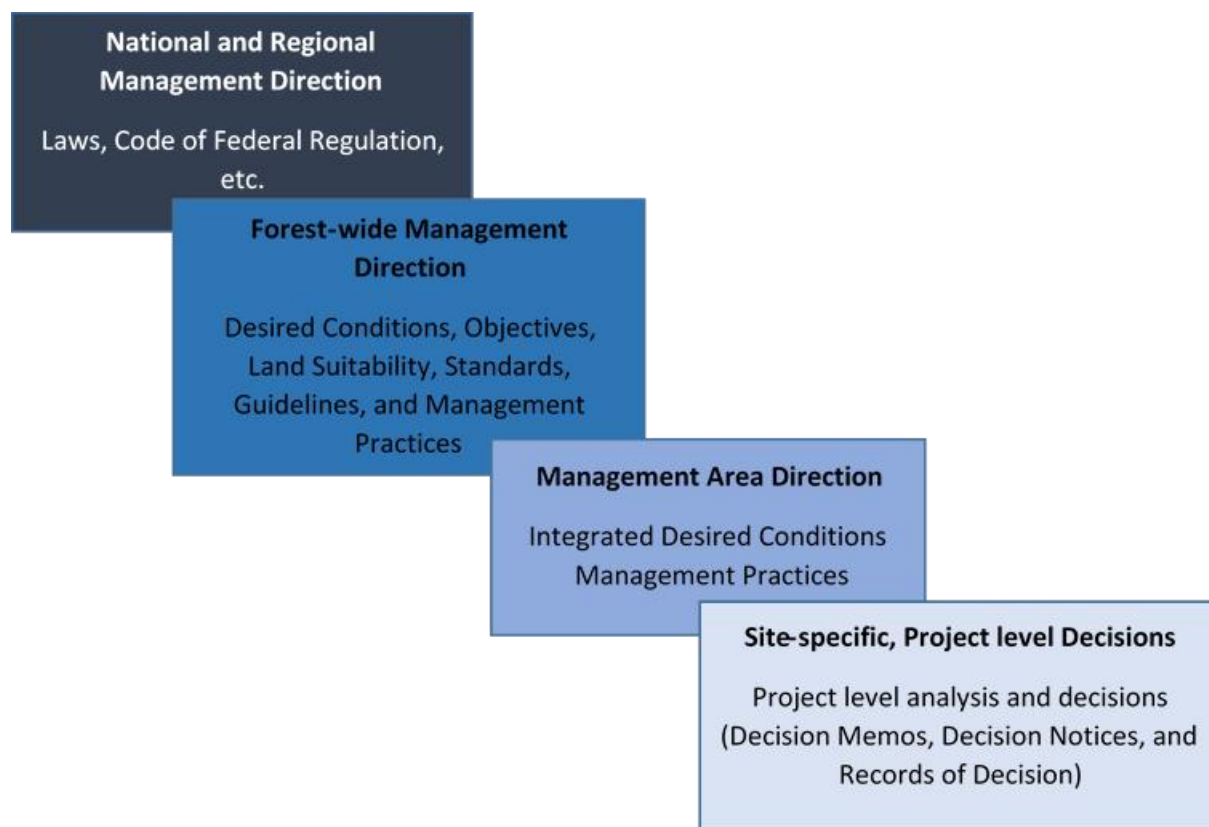


Figure 16. Hierarchy of national forest management direction

Federal Statutes

Applicable Federal statutes that forest management must be in compliance with are listed in Table 25.

Table 25. Federal Statutes applicable to forest management

Title	Initiation/Expiration
Agriculture Appropriations Act	May 23, 1908
Alaska National Interest Lands Conservation Act	December 2, 1980
American Indian Religious Freedom Act	August 11, 1978
American with Disabilities Act	1990
Anderson-Mansfield Reforestation and Revegetation Act	October 11, 1949
Antiquities Act	June 8, 1906
Architectural Barriers Act	1968
Bankhead-Jones Farm Tenant Act	July 22, 1937
Bald and Golden Eagle Protection Act	June 8, 1940, amended 1962
Cabin Fee Act	December 22, 2014
Carson-Foley Act of 1968 (PL 92-516)	
Clarke McNary Act	June 7, 1924
Clean Air Act	July 14, 1955
Clean Air Act	August 7, 1977; Amendments of 1977 and 1990
Clean Water Act as amended	1948; amended in 1972, 1977, 1981, and 1987
Color of Title Act	December 22, 1928
Cooperative Forestry Assistance Act	July 1, 1978
Department of Agriculture Organic Act	August 3, 1956
Disaster Relief Act	May 22, 1974
Emergency Flood Prevention Act (Agricultural Credit Act)	August 4, 1978
Endangered Species Act as amended	December 28, 1973
Energy Policy Act	August 8, 2005
Energy Security Act	June 30, 1980
Executive Order 13112	1999
Federal Advisory Committee Act	October 6, 1972
Federal Aid Highway Act	
Federal Cave Resources Protection Act	November 18, 1988
Federal Insecticide Rodenticide, and Fungicide Act	October 21, 1972
Federal Land Exchange Facilitation Act	August 20, 1988
Federal Land Policy and Management Act	October 21, 1976
Federal Lands Recreation Enhancement Act	2004
Federal Noxious Weed Act	January 3, 1975
Federal Power Act	June 10, 1920
Federal Records Act	September 5, 1950
Federal-State Cooperation for Soil Conservation Act	December 22, 1944

Title	Initiation/Expiration
Federal Water Pollution Control Act	July 9, 1956, as amended (Water Quality Act of 1965, Clean Water Restoration Act of 1966)
Federal Water Project Recreation Act	July 9, 1965
Fish and Wildlife Conservation Act	September 15, 1960
Fish and Wildlife Coordination Act	March 10, 1934
Forest and Rangeland Renewable Resources Planning Act	August 17, 1974
Freedom of Information Act	November 21, 1974
General Exchange Act	March 20, 1922
Granger-Thye Act	April 24, 1950
Healthy Forest Restoration Act	April 7, 1989
Highway Safety Act	September 9, 1966
Historic and Archaeological Data Preservation Act	May 24, 1974
Historical Sites Act	August 21, 1935
Knutson-Vandenberg Act	June 9, 1930
Land Acquisition Act	March 3, 1925
Land Acquisition-Declaration of Taking Act	February 26, 1931
Land and Water Conservation Fund Act	September 3, 1964
Law Enforcement Authority Act	March 3, 1905
Migratory Bird Treaty Act	1918
Mineral Leasing Act	February 25, 1920, as amended
Mineral Leasing for Acquired Lands Act	August 11, 1955
Mineral Materials Act	July 31, 1947
Multiple-Use Sustained Yield Act	June 12, 1960
National Environmental Policy Act	January 1, 1970
National Energy Conservation Policy Act	1978
National Forest Management Act	October 22, 1976
National Forest Roads and Trails Act	October 13, 1964
National Forest Ski Area Permit Act	1986
National Historic Preservation Act	October 15, 1966, as amended
National Trails System Act	October 2, 1968
National American Graves Protection and Repatriation Act	January 23, 1990
Occupancy Permits Act	March 4, 1915
Organic Administration Act	June 4, 1897
Pipelines Act	February 25, 1920
Public Lands Surveys Act	August 30, 1899
PL 102-575	October 30 1992
Real Property Quiet Title Action Act	October 25, 1992
Rehabilitation Act	1973, as amended
Renewable Resources Improvement Act	June 30, 1978
Research Grants Act	September 6 ,1958
Right of Eminent Domain Act	August 1, 1888
Rural Development Act	August 30, 1972

Title	Initiation/Expiration
Safe Drinking Water Act	November 16, 1977, and Amendments
Secure Rural Schools and Community Self-Development Act	2000
Sikes Act	September 16, 1960
Sisk Act	December 4, 1967
Small Tracts Act	January 12, 1983
Soil and Water Resources Conservation Act	November 18, 1977
Solid Waste Disposal (Resources Conservation and Recovery Act) Act	October 21, 1976
Supplemental National Forest Reforestation Fund Act	September 19, 1972
Surface Mining Control and Reclamation Act	August 3, 1977
Surface Transportation Assistance Act	1978
The Act	November 16, 1973
The Act	May 26, 2000
The Wilderness Act	1964
Timber Export Act	March 4, 1917
Timber Exportation Act	April 12, 1926
Title Adjustment Act	April 28, 1930
Toxic Substances Control Act	October 11, 1976
Transfer Act	February 1, 1905
Uniform Federal Accessibility Standards	1968
Uniform Relocation Assistance and Land Acquisition Policies Act	January 2, 1971
U.S. Criminal Code (Title 18 USC Chapter 91- Public Lands)	June 25, 1948
Volunteers in the National Forests Act	May 18, 1972
Water Quality Improvement Act	April 3, 1965
Water Resources Planning Act	July 22, 1965
Watershed Protection an Flood Prevention Act	August 4, 1954
Wild and Scenic Rivers Act	October 2, 1968
Wildfire Suppression Assistance Act	2003
Wilderness Act	September 3, 1964
Wood Residue Utilization Act	December 19, 1980
Youth Conservation Corps Act	August 13, 1970

Regulations

The Forest also abides by regulations listed in Table 26 as they pertain to the Forest Service.

Table 26. Regulations applicable to forest management

CFR	Title
36 CFR 60	National Register of Historic Places
36 CFR 63	Determinations of Eligibility for Inclusion in the National Register of Historic Places
36 CFR 68	Secretary of the Interior's Standards for the Treatment of Historic Places
36 CFR 79	Curation of Federally Owned and Administered Archeological Collections
36 CFR 212	Forest Development Transportation System
36 CFR 213	Administration Under Bankhead-Jones Act
36 CFR 219	Planning Rule
36 CFR 220	National Environmental Policy Act
36 CFR 221	Timber Management Planning
36 CFR 223	Sale and Disposal of National Forest System Timber
36 CFR 228	Minerals
36 CFR 241	Fish and Wildlife
36 CFR 251	Land Uses
36 CFR 254	Landownership Adjustments
36 CFR 261	Prohibitions
16 U.S.C. 470ii	Protection of Archeological Resources
P.L. 114-35	Cave Resources Protection Act
36 CFR 291	Occupancy and Use of Developed Sites and Area of Concentrated Public Use
36 CFR 293	Wilderness Primitive Areas
36 CFR 294	Special Areas
36 CFR 295	Use of Motor Vehicles off Forest Development Roads
36 CFR 296	Archeological Resources Protection Act Uniform Regulations
36 CFR 297	Wild and Scenic Rivers
36 CFR 800	Advisory Council on Historic Preservation
36 CFR 1222-1238	Federal Records Act Uniform Regulations
40 CFR 121-135	Watersheds Programs
40 CFR 1500-1508	Council on Environmental Quality
	Guidance for Implementation of Federal Wildland Fire Management Policy (2009)
P.L. 108-148	The Healthy Forest Restoration Act
	Interagency Prescribed Fire Planning and Implementation Procedures Guide (2014)
NFES 2724	Interagency Standards for Fire and Fire Aviation Operations
PMS 484	National Cohesive Wildland Fire Management Strategy (2014)
43 CFR Part 10	Native American Graves Protection and Repatriation Act
43 CFR 8340	Off-road Vehicles
42 U.S.C. 7401	National Ambient Air Quality Standards
NFPA 70	National Electrical Code
NFPA 70B	National Fire Code

CFR	Title
	USDA Forest Service National Fire Plan (2000)
2000	Uniform Building Code
7 CFR 15e	Enforcement of Nondiscrimination
28 CFR 36	Nondiscrimination on the Basis of disability by Public Accommodation and in Commercial Facilities

Executive Orders

Executive orders applicable to forest management are recorded in Table 27.

Table 27. Applicable Executive orders

Executive Order Number	Title
11593	Protection and Enhancement of the Cultural Environment
11990	Protection of Wetlands
11644/11989	Use of Off-Road Vehicles
11988	Floodplain Management
12088	Federal Compliance with Pollution Control Standards
12898	Environmental Justice
12962	Recreational Fisheries
13007	Indian Sacred Sites
13112	Invasive Species, as amended
13287	Preserve America

Policies and Guidelines

The forest plan will follow all applicable policies and guidelines, including:

- Forest Service Heritage Strategy
- All Forest Service Manuals
- All Forest Service Handbook
- Secretary of the Interior's Standards Guidelines for Archeology and Historic Preservation
- USDA Forest Service Strategic Plan: FY2015-2020 or most current version

State and Local Direction

State and local direction applicable to forest management is listed below:

- Colorado Air Quality Protection Act
- Water Division 3, Water Decrees Forestwide.
- Memorandum of Understanding 14-MU-11132400-004 between the Forest Service and the Natural Resource Conservation Service for permitting and operating SNOTEL, SCAN, and manual snow survey sites.

- Memorandum of Understanding 14-MU-11020000-053 between the Forest Service and the State of Colorado Department of Public Health and Environment for management of water quality in State of Colorado define Source Water Assessment Areas on National Forest Systems lands in Colorado.
- Memorandum of Understanding 15-MU-11020000-072 between the Forest Service and the State of Colorado Department of Natural Resources and the Colorado Water Conservation Board to establish a framework for the parties to work together in a cooperative manner on issues regarding the management of water and water uses on National Forest System lands in Colorado.

Appendix I. Proposed and Possible Actions

Introduction

In compliance with 36 CFR 219.12, this appendix describes proposed and probable actions that may take place on the Rio Grande National Forest at the project level over the next 3 to 5 years. These projects implement the forest plan and work to maintain existing conditions or achieve desired conditions described in the forest plan. Included are items such as program strategies; inventories, assessment, resource analysis and other planning needs; and ongoing work with partners and cooperating agencies anticipated during the next 3 to 5 years.

The listed proposed and probable management practices are not intended to be all-inclusive, nor are they intended to be decisions or commitments, but simply projections of what actions may take place in the future. A plan amendment is not required to change or modify any proposed or possible actions. The list of the actions can be updated at any time through an administrative change to the plan. More information may be found under plan objectives and management approaches.

Goal 1

Maintain and restore sustainable, resilient terrestrial ecosystems

Terrestrial Ecosystems

- Maintain and restore habitat connectivity where appropriate to improve adaptive capacity of native plants and animals. Collaborate with partners to establish priority locations for maintaining and restoring habitat connectivity.
- Restore fire to the landscape where conditions are appropriate.
- Monitor insect and disease infestations and treat epidemic outbreaks.
- Thin and use wildfire to restore or maintain habitat when appropriate.
- Focus invasive species treatments on high priority invasive species and infestations as identified in the most recent version of the invasive species action plan. Prioritize areas such as wilderness, research natural areas, botanical areas, wild, scenic and recreational areas, and aquatic and riparian areas to maintain the integrity of native species and ecosystems. Promote early detection and rapid response as an effective approach to minimize spread.

Range

- Review active allotment management plans on a regular basis.
- Maintain and replace fencing, water, and other range improvements.

Species of Conservation Concern

- Map populations of insect species that are species of conservation concern or threatened, endangered, proposed, or candidate species so that interdisciplinary teams can use the information to design projects to avoid impacts to these species.

Threatened, Endangered, Proposed, and Candidate Species

- Evaluate and update current lynx linkage areas with partners to provide the desired habitat connectivity functions, as practical and needed based on available resources.

Wildlife

- Increase the number of Naturewatch viewing sites that focus on bird conservation; participate in events for International Migratory Bird Day.
- Establish a maintenance program for existing bat gates.

Soils

- Map soil types that support edaphic plant species of conservation concern. Include volcanic substrates such as ash-tuffs, latitic lava flows, rhyolite, and andesitic substrates. Sedimentary substrates supportive of edaphic species include calcareous substrates such as limestone and shale.

Fire

- Assess burned areas to determine suitable and effective emergency stabilization and rehabilitation needs to meet current and anticipated environmental conditions.
- Implement fuels management activities to protect unique features, reduce fire behavior to an acceptable level, or replicate natural disturbance regimes within the constraints of the management area for the proposal.

Timber Management

- In areas suitable for timber production, salvage dead or dying trees (due to fire, insects, disease) to recover the economic value of the wood while providing for ecosystem function. This will be the primary focus of the timber program for the first three years of the planning period.
- The majority of the timber harvest in the next 3 to 5 years is anticipated to be salvage to recover economic value of the beetle-killed trees (Table 28).

Table 28. Planned timber sale program (annual average volume output)

[Based on average base funding and an estimated sustained yield limit of 73.7 MCCF]

	1st Decade – Years 1 – 3		1st Decade - Years 4 and 5		1st Decade – Years 6 – 10		2nd Decade	
Alternative B Modified	CCF	MBF	CCF	MBF	CCF	MBF	CCF	MBF
Timber Products	Does not include salvage or sanitation volumes							
	Lands suitable for timber production							
A1. Sawtimber	0	0	5,600	2,464	8,400	3,696	8,400	3,696
A2. Other products	0		2,400		3,600		3,600	
C. Projected Timber Sale Quantity (A1 + A2)	0	0	8,000	2,464	12,000	3,696	12,000	3,696

	1st Decade – Years 1 – 3		1st Decade - Years 4 and 5		1st Decade – Years 6 – 10		2nd Decade	
Other Estimated Wood Products	Does not meet timber product utilization standards							
	CCF	Tons	CCF	Tons	CCF	Tons	CCF	Tons
D. Fuelwood	7,200	8,600	7,200	8,600	7,200	8,600	7,200	8,600
E. Projected Wood Sale Quantity (C + D)	7,200		15,200		19,200		19,200	
	CCF	MBF	CCF	MBF	CCF	MBF	CCF	MBF
F. Estimated Salvage Volume	62,800	31,400	20,000	10,000	0	0	0	0
G. Total Volume including Salvage (E + F)	70,000		35,200		19,200		19,200	

Table 29. Planned management activity under alternative B Modified – annual average per decade

Forest cover type/ Management Practice	1st Decade (years 1 – 3) (acres)	1st Decade (years 4 – 5) (acres)	1st Decade (years 6 – 10) (acres)	2nd Decade (acres)
Spruce-Fir – Salvage Sales	6,280	2000	0	0
Ponderosa Pine and Mixed-Conifer (thinning, uneven-aged management, and shelterwood treatments) and Aspen (regeneration harvests)	0	800	1,200	1,200
Ponderosa Pine and Mixed-Conifer Prescribed burns	700		800	800
Spruce-Fir Prescribed Burns (piles)	190		0	0
Grasslands Prescribed Burns	100		100	100
Pinyon-Juniper Prescribed Burns	50		50	50

Goal 2

Protect and restore watershed health, water resources, aquatic ecosystems, and the systems that rely on them

Aquatic and Riparian Ecosystems

- Use vegetation treatments to restore the structure, function, and composition of riparian areas and meadows where encroachment is impacting meadow function.
- Restore nonfunctioning or functioning at-risk riparian areas so they are in, or are moving toward, proper functioning condition.

- Maintain and restore habitat connectivity where appropriate to improve adaptive capacity of plants and animals. Collaborate with partners to establish priority locations for maintaining and restoring habitat connectivity.
- Restore degraded spring sites back to functional habitat for spring-dependent species.
- Reconstruct or restore riparian function to springs identified as not in proper functioning condition.

Water, Soils, and Watersheds

- Plan and implement improvement activities in priority watersheds that are functionally at risk or impaired.
- Update the priority watershed list to reflect actual needs on the ground.
- Maintain and restore the connections of floodplains, channels, and water tables to distribute flood flows and sustain diverse habitats.
- Implement resource improvement projects that are beneficial for maintaining and improving soil conditions and productivity, and water quantity and quality.
- Complete on-site investigations and refinement of maps for soil-disturbing projects that require site-specific, precise, and highly detailed soil information that is beyond the scale of the current soil surveys.

Goal 3

Actively contribute to social and economic sustainability in the broader landscape and connect citizens to the land

Local Communities

- Work to maintain and expand contracting and partnering opportunities with local governments, businesses, and organizations. Develop partnerships that leverage different sources of funding to support opportunities to contribute to economic and social sustainability of local communities.

Recreation

- Engage cooperators in stewardship activities and framework design.
- Furnish readily available offsite and onsite information about recreation opportunities at fee campgrounds.
- Coordinate trail development with trail systems developed by municipalities, counties, states, other Federal agencies, and partners to allow for integration and connectivity.

Scenery

- In all vegetation treatment and fuel reduction projects, consider improving scenery resources, especially in area that do not meet established scenery objectives.

Cultural Resources

- Protect fire-sensitive sites from activities that may include vegetation treatment, including prescribed fire and thinning, in and adjacent to site boundaries provided that appropriate protective measures are in place. Erosion, severe fire effects, and livestock congregation can result from “islanding” if sites are only avoided and not treated.
- Synthesize, interpret, and share cultural resource findings with the scientific community and public through prehistoric and historic contexts, formal presentations, publications, and educational venues.
- Annually complete non-project inventory to uphold the Section 110 mandate of the National Historic Preservation Act by prioritizing the following:
 - Areas where eligible cultural resources are threatened or ongoing impacts are unknown
 - Areas indicated to have high cultural value or high density of cultural resources
 - Areas of importance to traditional communities
 - Areas where additional survey will contribute to a greater regional understanding of a specific management unit or special interest area.
- Develop and maintain collaborative partnerships and volunteer efforts to assist the Forest Service in researching and managing its cultural resources. Develop partnerships with traditional communities, nonprofits, volunteers, professional organizations, and schools.
- Develop management and preservation plans for administrative facilities and infrastructure that are significant cultural resources with special significance, or are sites that receive heavy visitor use.
- Encourage volunteer participation in cultural resource conservation activities such as research, site stabilization, conservation, and interpretation.
- Engage local communities in cultivating economic development opportunities for heritage tourism.
- Develop a database of fire-sensitive sites, structures, and other resources to facilitate resource protection during fire management.
- Provide opportunities for line officers and Forest Service employees to receive training to gain a broader understanding of the unique legal relationship between the Federal Government and Indian tribes, and to learn about American Indian law, customs, traditions, and values.
- Through consultation, identify other plants that may be important to tribes.
- Identify oshá populations.
- Work to understand the community needs of tribes and build respectful, collaborative relationships to achieve mutually desired conditions.
- Maintain the current heritage database.
- Properly preserve historic documents, such as photographs and maps, and make them available for research and interpretation.
- Cultivate economic development opportunities for heritage tourism in coordination with local communities.

Areas of Tribal Importance

- Develop interpretive and educational exhibits or other media that focus on the history of Forest lands in collaboration with tribes to provide the public with a greater understanding and appreciation of our shared history, culture, and traditions.
- Develop an interpretive and educational site to help prevent vandalism at the Natural Arch.
- Develop interpretive and educational site materials in concert with tribes that can aid in protecting areas of tribal importance.
- Develop a management plan to assist in maintaining cultural values associate with Mount Blanca, involving staff from the San Luis Valley, Bureau of Land Management, Pike-San Isabel National Forest, interested tribes, the U.S. Fish and Wildlife Service Sangre de Cristo Conservation Area, and other non-Federal partners.
- Identify, evaluate, and protect areas acknowledged as traditional cultural properties and work with associated communities to collaboratively manage areas acknowledged as traditional cultural properties by developing programmatic agreements, management plans, memoranda of understanding, or other management tools.

Congressionally Designated Trails (CDT)

- Provide appropriate signage at prominent access points along the Old Spanish National Historic Trail to enhance trail user experience and safety.
- Identify and pursue opportunities to acquire lands or rights-of-way in or adjacent to the Continental Divide National Scenic Trail corridor.
- Provide consistent signage along the trail corridor at road and trail crossings to adequately identify the trail and provide interpretive signs at key trail entry points and limited historic and/or cultural sites to orient visitors and enhance the visitor experience.
- Establish appropriate carrying capacities for specific segments of the Continental Divide National Scenic Trail, monitoring use and conditions, while taking appropriate management actions to maintain or restore the nature and purposes of the trail if the results of the monitoring or other information indicate a trend away from the desired condition.

Infrastructure

- Manage all facilities according to the current Facilities Master Plan.
- When necessary, develop new trails to expand the range of recreation opportunities, ensure user safety, and disperse existing use into different areas to be consistent with other resource objectives.
- Manage road use by seasonal closure if:
 - Use is causing unacceptable damage to soil and water resources due to weather or seasonal conditions
 - Use is causing unacceptable wildlife conflicts or habitat degradation
 - Use is resulting in unsafe conditions due to weather conditions
 - The road(s) serves a seasonal public or administration need
 - The area accessed has a seasonal need for protection or non-use.

- Inspect dams on National Forest System lands to ensure public safety and comply with all appropriate laws and regulations. Assure that high- and moderate-hazard dams have current Emergency Preparedness Plans.
- Inspect facilities with potable water use to ensure public safety and comply with all appropriate laws and regulations.



**United States Department of Agriculture
Forest Service**

Rio Grande National Forest
1803 W. Highway 160
Monte Vista, CO 81144

www.fs.usda.gov/main/riogrande/